CAUSE: A CRITICAL AND HISTORICAL EXAMINATION OF SOME USES OF THE TERM

by

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CONTENTS

CONTENTS (Cont'd)

ABSTRACT.

The following thesis discusses some uses of the term 'cause' with a view to elucidating some 'causal' problems and conflicting assertions about 'causes' found among philosophers.

Some commonsense uses are first examined (as those met earliest by any philosopher), and then the term's treatment by a representative selection of philosophers. The positions of Aristotle, Hume, and Kant are discussed in some detail, those of the others more briefly.

Many philosophers have believed themselves referring to a non-verbal relation in using the term 'cause'; some supposing this relation necessary. These opinions stand condemned if words cannot express information about anything but symbols; and the view of 'causation' as a relation both non-verbal and necessary is false if necessity is properly predicable of verbal connections alone. The main discussion is therefore prefaced by a brief examination of these general questions; this concludes that words can refer to something other than symbols and that there are some non-verbal entailments so that the claims made for the term 'cause' by plain men and philosophers may be considered on their own merits.

Two main contentions about 'causes' are found claiming attention: (a) everything is caused in the sense of being somehow explicable (a view shared by plain men, Aristotelians, and other rationalists); (b) every event is 'caused' in the sense of being preceded by another which it follows necessarily (the subject of most post-Humean discussions of 'causation').

That everything is somehow explicable is found incapable of proof or disproof but to appear endemic to human thought so that it is doubtful whether anyone has been entitled to deny it.

Necessary connection between events is found conceivable and often consistent with the facts, though incapable of proof; and, indeed, as Ewing contends, (1) sometimes (namely in the reasoning process) it seems undeniable. But that each event follows necessarily on another is found incapable of proof, nor is the available evidence found to support this conclusion unanimously.

(1) Cf. his contribution to the Symposium on Mechanical and Teleological Causation in the Supplementary Proceedings of the Aristotelian Society 1935 (Vol XlV)

INTRODUCTION.

(1) Philosophy and language - The aim and method of this enquiry.

(a) The relevance of the question: 'How has the term "cause" been used?'

It will, I suppose, be generally agreed that the task of the philosopher is not simply an empirical enquiry into the use of words. It is true that, of recent years, many thinkers have held that philosophy is concerned solely with linguistic problems, but these thinkers certainly do not intend to identify the roles of the philosopher and philologist. They define philosophy as the study of the formal principles in accordance with which language may be constructed and manipulated.

Yet even the most extreme formalist cannot be completely indifferent to the empirical question unless he wishes to confine himself to purely private speculations. If he is to say anything about the assertions of other thinkers, he must observe how they have, in fact, used terms. Even in the classic of pure formalism 'Logical Syntax of Language' Carnap shows an interest in the way words have been used. He wishes to illustrate his thesis that the contentions of philosophers assert nothing but rules about the use of language, and in order to do this he must show how the philosophers formulating them have used language. Thus in order to show that the conflicting contentions concerning primitive data are nothing but differemt rules for the use of words, he must notice the way in which thinkers have used the term 'primitive data'. (1).

When anyone asks such a question as 'What is philosophy?' or 'What is causation?' he is interested in the way such words are, and have been, used. He may be convinced that he is not asking a question about the use of words, but a little reflection would show him that the answer to the question 'How has the term 'philosophy' (or 'causation') been used?' is relevant and indeed indispensable to any answer to the former questions, which would satisfy him. I remember as a child being shown over the University College at Bangor and, on seeing a stained glass window representing philosophy, asking just this question 'What is philosophy?'. It is clear to me that whatever might or might not have satisfied my curiosity, it would not have been satisfied until I had learned how the term 'philosophy' was used. Had someone provided me with a highly original definition it would not have satisfied me or answered my question, no matter what good reasons he might have put forward for adopting it. I was not interested in establishing a rule for the use of the term, however ingenious or well founded, I was concerned to understand other people when they formulated sentences containing the term and this I could not do without learning how they used it. (What is involved in discovering how a term A is used, and whether more than this is required in order to answer adequately the question 'What is A?' will be discussed below).

Plato asked explicitly 'What is justice?' but most philosophers do not ask such questions explicitly. Instead they 'discuss justice (causation etc.); that is to say they formulate sentences containing the term 'justice' ('causation' or whatever it may be) as subject and/or sentences from which sentences containing that term as subject are derivable in accordance with the transformation rules of the language they are using. It is evident that in so doing they are assuming an answer to the question 'What is justice?' at least insofar as this involves a decision to use that term in accordance with some consistent rule.

Further whenever a philosopher 'discusses justice' he intends the sentences he formulates to be relevant to the 'discussion of justice' by other thinkers. But this means that he must either adopt the usage of those others or else make explicit his deviation from it. In either case he must have answered the question 'What is justice?' insofar as this involves answering the question 'How has this term been used by X, Y and Z?' It is true that one philosopher's discussion of justice' need not be relevant to that of any other; it would be possible to use the term in a purely private way so that one's 'discussion of the subject' was entirely irrelevant to that of everyone else. A person who adopted such a procedure might, in the course of his 'discussion', make remarks which were both justified formally in terms of the linguistic rules he had adopted, and 'true in the ordinary sense of the term.

I might, for instance, define 'justice' as synonymous with 'archaeology'; using the latter term as is customary among the English. Then I could 'discuss justice' consistently and further, so long as my 'knowledge of archaeology' was adequate, I could, in the course of this discussion, make 'true assertions' in the ordinary sense of this phrase. I might, for example, with both truth and logical justification, make such statements as the following: 'I am interested in justice'; 'our knowledge of justice is based on the results of careful excavations'; 'Sir Leonard Woolley has greatly contributed to our knowledge of justice'; It is simply an historical fact (one not unnatural, man being a gregarious animal) that whenever a philosopher has used terms which he knows others to have used also, he intends and supposes the sentences he formulates containing them to have some relevance to at least some of the sentences formulated by at least some of those others which either contain that term or are deducible from sentences which do. Very scant acquaintance with the works of philosphers reveals that many of them formulate sentences which are irrelevant to those formulated by many others yet containing a common term: many sentences containing the term 'cause' formulated by modern thinkers are completely irrelevant to numerous sentences in which Aristotle uses it. This is not peculiar to philosophy, however; Latin sentences containing the term 'mare' are often completely irrelevant to English sentences in which it occurs, just as Elizabethan English sentences containing the terms 'presently', 'silly', 'awful'

may be completely irrelevant to modern English sentences in which they occur. Yet Latin sentences containing the term 'mare' are relevant to each other and so are Elizabethan English sentences containing the term 'awful'. Similarly no philosopher acquainted with only the Aristotelian use of the term 'cause' for example, has formulated sentences in which that term occurs which are irrelevant to all the sentences in which Aristotle has used it. Some of the thinkers in this position criticised and rejected the Aristotelian usage, but criticism and rejection of a thinker's usage can hardly be regarded as irrelevant to it. To assert that 'causation is a relation not of necessary connexion but of regular sequence' is no more irrelevant to the statements of those who have defined 'causation' in terms of 'necessary connexion' than is the sentence 'No it is raining' irrelevant to the statement 'It is a fine evening'. In this connection it is interesting to note that when a philosopher has adopted a new usage of common term, this usage is generally closely correlated to the old; generally the new usage either constitutes a sub-section of the old one or is such that the old one forms a natural sub-section of it. Thus for example, Descartes explicitly rejected the usage of the term 'motion' current among his Scholastic contemporaries (2) Yet the usage which he introduced was no more revolutionary than a subsection of the old; he had decided to apply the term to only one type of change instead of applying it to change in general as did the Scholastics.

Similarly, though Aristotle uses the term 'cause' very differently from the post-Cartesian rationalist, yet both agree that the term is translatable in some contexts with the term 'explanation'; they differ only in that Aristotle is prepared to substitute 'cause' for 'explanation' in more contexts than is the post-Cartesian.

It is unfortunately true that thinkers have not always been aware of a difference in usage between themselves and those to whose remarks they have supposed their own relevant. This again is no peculiarity of philosophers: north and south country English folk may find themselves talking equally at cross purposes while using terms common to them both such as 'pie', 'cake' and 'loaf'. This argues no more than their failure to fulfil one of the conditions necessary to the achievement of their purpose: it does not prove that condition less necessary. For they simply do not succeed in making their remarks relevant to those of each other as they intend. They would prove understanding A's usage unnecessary to speaking relevantly to his assertions only if they succeeded in doing the latter without having such understanding. Instead they fail in relevance precisely insofar as they misunderstand each the other's usage.

My intentions in writing this thesis do not differ from the common ones. In using and considering the term 'cause' I am interested in the sentences which others have formulated which either contain it or are deducible (according to their usage) from

others that do; and, in discussing this term, I wish to say something relevant to these sentences.

I shall indeed be more particularly interested in the ways in which the term has been used than have been many philosophers. The ease with which two people may talk at cross purposes while using common terms has but just been remarked; it seems therefore essential, in examining the various assertions containing or relevant to any term, to consider the uses of that term. Where those assertions are the subject of dispute, or consist in the acceptance or rejection of the views of another, it is necessary to understand the usages of all parties concerned; for if A says in effect that B is talking nonsense, he and B may be talking at cross-purposes and this one cannot know unless one understands the usage which each is employing. When therefore, there is a term which has been and continues to be the subject of numerous conflicting statements, it is of primary importance to know how that term has been used in these various statements if anything relevant to them is to be said. Such a term is 'cause', and I intend to examine its various uses in the hope of elucidating the evaluation of some conflicting assertions containing, and relevant to, it which have been made. The long history of the term (or its synonyms), and the alterations in its usage which have evolved in the course of that history were noted above. A study of the major historical uses of the term together with the sources and courses

of the principal among these alterations cannot but contribute to this end, particularly as philosophers in using the term generally suppose their remarks relevant to some at least of the major historical 'discussions' or 'theories' concerning 'cause'. In the following pages I intend to concentrate on the evolution of the term, seeking similarities, differences and other relations between the various usages. Nevertheless I shall not be concerned exclusively with how the term has been used, for I wish my remarks to be relevant to those of others who have used the term not simply in the sense of describing how they have done so but also in the sense of saying something relevant to the admissability of statements about 'cause' made and implied by these others.

(b) The Problem of Meaning.

It would be agreed, I think, that many would deny that a question of the type 'What is philosophy?' is simply an enquiry into the use of words, though, as was seen above (3) they could not well deny that its answer involved the results of such an enquiry. Those who hold this view would likewise maintain that, in order to 'discuss causation' so that one's remarks are both useful and relevant to those of others 'on the same subject', more is needed than 'knowledge of the way in which those others use the term'. This contention rests largely, if not entirely, on a particular definition of the phrase 'knowledge of another's use of a term'. Anyone defining 'knowledge of A's use of a term' in some such manner as 'knowledge of the way in which A uses a term to express a particular meaning', or 'knowledge of the meaning to express which A uses a term', in all probability, regards such knowledge as a sufficient condition of a useful discussion concerning A's sentences containing a given term or implying those that do. The view in question amounts, for instance, to the denial that one could say anything relevant to Aristotle's discussion of 'causation' that was either interesting or useful, if one knew only that in certain contexts, specified entirely in terms of words and their formal correlations, he treated 'explanation' and 'cause' as interchangeable terms.

I remarked (4) that my motive in asking 'What is philosophy?' had been to 'understand' sentences in which that term occurred.

Those who maintain the view outlined above hold two beliefs: (a) that in order to say anything useful about A's 'discussion of causation' it is necessary to 'understand' the sentences in which he uses the term 'cause' (those deducible from these and those of his sentences from which others containing the term or its synonyms are deducible); and (b) that in order to 'understand' these, knowledge of verbal definitions is not enough.

The first of these beliefs would be generally accepted: the extreme formalist denies the second only; that is to say he agrees that one must 'understand' A's sentences before one can 'discuss' them adequately, but maintains that 'understanding' them consists simply in knowing the formal rules governing their use and that of the terms they contain. The anti-formalist on the other hand, contends that any term of which it is appropriate to say 'I understand' has 'Meaning' in the shape of a non-formal characterisitc, involving or containing a reference of some sort to something other than itself which may be non-verbal altogether.

It is evident that it is impossible to discuss any term or evaluate any sentence adequately unless one first answers the question whether or not any term may have meaning in this non-formal sense. I shall, therefore, examine this question as briefly as possible. As necessarily brief, my discussion cannot claim to be exhaustive; I hope merely to indicate the grounds of which my views are based.

It must be remembered that whereas a negative answer to the question 'May a term have "meaning" in the non-formal sense also answers the question whether any particular term has 'meaning' in this sense, an affirmative answer to the first question does not do so; for there would be no contradicition in supposing that though it was possible for a term to have meaning in this sense in fact there was none which had, or that though some possessed it there were others that did not. Therefore, even though it may be found that a term may have 'meaning' in this sense, and even that some terms do, it is still possible that 'cause' does not. Consideration of the general question is relevant, and indeed indispensable, to the discussion of any particular term not because its answer will necessarily show whether that term has non-formal 'meaning' (though this may show that it has not) but because from the answer to this question it is possible to discover whether there is any point in asking with respect to any particular term. 'Has it "meaning" in the non-formal sense?'

It would be admitted by both the formalists and their opponents that the criterion by which we judge a person's 'understanding' of a term in accordance with the usage of any language, is his ability to use that term according to the rules prescribed for that language. (The anti-formalist would, of course maintain that 'understanding' a term, though this involves ability to use it correctly i.e. according to the rules of the language concerned, does not consist in this, or at the most that it does not consist

in this alone). An examination of the conditions necessary to the 'correct' use of terms will, therefore, help to show what is involved in 'understanding' them.

There is no doubt that we can learn to use many terms correctly by means of verbal definitions. This is best illustrated by the process of learning a foreign language (at least when it is learned in the old fashioned way). A complete language, (i.e. all the terms correlated according to a single set of linguistic rules, and their correlations) may be learned solely by the study of the formal rules contained in grammars and dictionaries. A little reflection will show, however, that it is not possible to learn all the correct uses of all the terms of any conversation language in this way. Verbal definiations enable us to do no more than substitute one word, or set of words, for another, according to prescribed rules. It is undeniable that most of the time we are using language we are doing this, and that sometimes at least we are doing no more. It is further true that within these languages there is no sentence incapable of being replaced by another according to the formal rules of the language containing it: thus the 'meaning' of one sentence may always be expressed, to some extent at least, by another. It is equally evident that it is impossible to express the 'meaning' of a term or set of terms without using language of some sort, since expressing anything simply consists in using symbols in a certain way. Further, if the 'meaning' of words is to be expressed in the language to which they

belong it can ordinarily be expressed only by more words since the word languages normally consist of words alone. Since it is clearly impossible to record or communicate the meaning of terms without expressing it by means of symbols, it is not surprising that when anyone wishes to record or communicate the 'meaning' of words he uses other words. Moreover, so convenient is the use of words that we normally think in terms of them whether we are wishing to record or communicate our thought or not; indeed it seems clear that the use of language is indispensable to the more complex thought processes at least. Thus in any discussion it is impossible to get away from words and the process of substituting one set of words for another. (5).

Yet this does not comprise all the uses of terms prescribed by the conversation languages. A verbal definition serves to teach us that the term 'red' may be substituted for 'rouge', the phrase 'This is red' for 'C'est rouge', when one is translating from French into English. It also teaches us that within the English language it is correct to substitute 'not green' for 'red' but that we may not substitute 'red' for 'not green; or 'green'. But according to conventions which everyone who speaks English recognises, there are occasions when it is correct to use the term 'red' and the phrase 'This is red' which consist neither in translating terms occurring either in English or any other language nor in the repetition of something learned by heart (as when the blind man says correctly but, as we should say, without justification 'The pillar box is red').

Similarly, there are occasions when he is neither translating nor repeating by heart, when it is correct for the Frenchman to use the term 'rouge' and the sentences 'C'est rouge'. 'Il n'est pas vert'. And there are innumerable terms in English, French, and all the other conversation languages of which this is true. Such usage can be neither established nor learned by means of purely formal rules which, by definition, are concerned solely with conditions for the translation or substitution of one symbol, or set of symbols, by another. In order that such a usage may be established or learned, it is essential that there should be something besides lingusistic rules in the situation which may be made its criterion. This of course is not to say that there must be any intrinsic connection between this criterion and the term whose usage it is made to condition. In order to use the term 'red' consistently on occasions other than those when one is translating it or repeating something by heart, it is necessary only to distinguish a particular type of phenomenon which is not a linguistic convention nor determined by one and to learn to use that term in reference to it, in accordance with a given rule.

The foregoing paragraph seems to me to formulate a convincing refutation of the formalist who would maintain that there is nothing relevant to 'meaning', nor to the construction of even the conversation languages, other than formal rules of sentence formation and transformation. And so, I think, it would appear to most people: Professor Ayer, for example, likewise argues (6) that the formalist position is fallacious on the ground that transformation rules

cannot teach us in what situations (apart from that of translation) a sentence may be used, and that such uses are intrinsic to the conversation languages. Yet no doubt the formalist would remain unconvinced, maintaining doggedly that in making such statements we are asserting no more than the way various terms and phrases may be correlated consistently with purely formal conventions of the English language: i.e. that the sentence 'Formation and transformation rules are inadequate to teach all the known uses of terms' is derivable, according to the formation and transformation rules of the English languages, from 'There is an use of terms, correct according to the conventions of the conversation langugges, which is other than translations or repetition by heart'. He would certainly be correct in saying that this assertion is part of, or involved in, my contention; for, as has been observed above, (7) it is obviously impossible to discuss anything without deriving one set of terms from another according to the formal rules of the language one is using. Yet to maintain that this is all the argument can be said to assert, is completely unjustified.

A philosopher would be justified in refraining from regarding a particular set of symbols as asserting more than a linguistic rule only if one of the following conditions were fulfilled: (a) if no set of symbols asserted more than such a rule; (b) if the particular set in question were so limited.

Were the first of these conditions fulfilled, however, it would be impossible to assert that this were so or to defend this contention. For a linguistic rule could do no more than forbid our using symbols to express anything but such a rule on the purely arbitrary ground that we had already decided not to do so; it could not render our using symbols thus, unconditionally unjustifiable. Condition (a) therefore would be more than a linguistic convention and hence its fulfillment would exclude the possibility of its own assertion and defence, for both of which symbols are needed.

A philosopher, therefore, is guilty of self-contradiction if he asserts that no set of symbols states more than a linguistic rule, if in saying so he intends to assert not merely that those who contradict him are wrong relatively to some convention but that they are asserting something inadmissible under any conditions. For if nothing but conventions are concerned there is nothing to prevent anyone adopting whichever he pleases so long as he makes it explicit and adheres to it consistently. Thus the first of the two conditions enumerated above cannot serve to justify a philosopher in denying that any or every set of symbols asserts nothing but linguistic rules, it can only justify him in restricting himself purely arbitrarily to the discussion of linguistic rules alone. There seems no reason for accepting this limitation however: it seems evident to me at least that I have all my life succeeded in using symbols to assert things other than linguistic rules. Moreover since no philosopher has in fact accepted this limitation, all

having treated some set of symbols as stating something other than such a rule, there seems no reason to suppose I have been mistaken in this. (8)

There is, therefore, no prime facie reason for supposing any sentence to state only a linguistic rule; it would consequently be unjustifiable to dismiss any assertion as purely linguistic unless provided with evidence for this in that sentence itself, its context or use. So far as the sentences under discussion are concerned, the evidence all points in the contrary direction. Not only is there nothing in them, their context and usage to suggest this limitation, but consideration of the argument, and the experiences of formulating it and being convinced by it strongly suggest the complete opposite. In the first place the argument carries conviction as no mere manipulation of the expressions of a purely formal language, such as those constructed by Carnap, does. For the conviction it carries is no mere assurance that I have acted according to the rules, which I may obtain equally in playing a game or constructing a watch. Of course this conviction includes such an assurance, since without observing the rules of logic and syntax correctly I could not obtain a justifiable conclusion; but it also contains an assurance which is other than this belief. For when I assert the conclusion that criteria other than formed rules are used in the construction of conversation languages, the conviction uppermost in my mind, that which I am trying to express, concerns not verbal rules but the character of something else which

has entered into my experience. Further it is not words alone which produce this conviction, though doubtless I could not obtain it without them. Were I provided with a translation of the argument in a language with which I was unfamiliar, merely being told sufficient of its transformation rules to realise the conclusion formally derivable from the premises, it would not produce this conviction in me though it would do so were I aware of its translation into a language I 'understood'. Indispensable to this conviction is the character of certain of my experiences, and in whose absence the verbal argument would fail to convince no matter in what language it was formulated, just as, in the absence of a certain experience, no acquaintance with verbal rules could produce the conviction which I am trying to express when I say 'I see a red patch'.

It has been contended that words are indispensable to all mental processes and that therefore it is impossible to appeal to experience as something distinct from the words used to describe it. This is a not unnatural conclusion from the close connection between thought and language noted above (9). It is a conclusion, moreover, strengthened by the fact that in appealing to experience philosophers generally consider phenomens we all learned to name in early childhood and of which, in consequence, we find it difficult to think apart from their names (or their names apart from them).

Yet I can refute this contention by a very simple experiment which I have just performed. This experiment is possible for me,

as it is not for everyone, because of my inability to remember the names of the musical notes. I have just stepped over to the piano and, without looking at the keyboard, struck a number of notes at random. Although I could not name them I had no difficulty in recognising the distinctive character of each (though I could never describe it whether I used the appropriate name or not) readily distinguishing one note from another. Mary Wilson writing in Analysis (10) seems to suggest that without the proper linguistic equipment it is impossible to recognise differences between one note and another. I think however, that she is here confusing inability to describe difference of pitch intelligibly with inability to discern it. Clearly I could not say truly 'These sounds differ in pitch' until I had learned to use the term 'pitch' correctly but this is not to say that I could not detect the difference which I so describe until I had learned to name it. Rather would this eem to be putting the cart before the horse since how could I learn to name a difference until I could detect it?

I remarked above that the experiment by means of which I was convinced of the formalist's error was made possible by my lack of a precise musical memory; it would not, therefore, convince universally. Hence it will be useful to point out that the same conclusion is demonstrated by a very common phenomenon. Each year thousands of children (not to mention adults) ignorant of both standard notation and tonic sol-fa learn to sing, hum, and whistle numerous tunes 'by ear'. It is evident that a person could not distinguish one tune from another, let alone consciously memorise and reproduce each

correctly, unless he were able to discern the distinctive character of the individual notes of which they are constituted, distinguishing one from another, since the distinctive character of a tune depends on those of the notes it contains, together with their relations to each other. It is true that when a person 'learns a tune by ear' he generally memorises not one particular set of notes but the mutual relations of its constituent notes. A person knowing some musical terminology would say that he memorises the order which the notes of the scale must have if they are to form this tune, but that he forgets the key in which he heard it sung or played. Now this is a very interesting phenomenon since it is clear that such an ability is completely independent of any explicit knowledge of scales and keys. Four year olds who couldn't tell what a scale was, who wouldn't even recognise one as such if they heard it, are yet able to 'learn the tunes' of nursery rhymes in this way simply from hearing them sung. I know I was able to 'learn tunes' in this way long before I had ever met a scale or would have known one had I done so. This phenomenon is far more serious to the formalist than the mere ability to discern the distinctive character of separate notes unnamed. For though forced to acknowledge this ability he might still console himself with the conviction that the discernment of relations among phenomena depended on language and the construction of artificial conventions. The musical scale might well seem, at first sight, an ideal case in point. For since we assert relations of notes only in terms of scales which are artifical constructs (more than one

such standard being possible), it might well seem that notes have no inherent relations to one another but that we can relate them only by deciding on a certain standard order for them in relation to which all other musical arrangements are distinguished and designated. It might be thought that when we speak of the mutual relations among the notes we are really speaking of nothing but a conventional method of describing them in terms of such a standard order. It is true that such an artificial convention is required if the relations between notes are to be described, but that these relations consist in nothing more is refuted by every four year old who learns to sing nursery rhymes by hearing them sung by others.

The denial of our ability to discern anything independently of language must rest, I think, on a confusion between what I have called simply 'discernment', and a much more complicated process involving memory and knowledge of verbal conventions. This confusion is not surprising since the majority of our 'perceptual experiences' are of the latter type. 'Discernment' is found alone only in experience of the type described above, which, though numerous, are rare relatively to the total number of 'perceptual experiences' of a normal adult. The majority of these involve judgments of the type 'This is red', 'This is a sharp'. Now it is evident that such a judgment involves knowledge of a certain rule for using words. But this in no way conflicts with the fact that among the criteria, given which I judge the appropriateness

of the term 'red' according to this rule, is something distinct from, and independent of, verbal rules. Indeed examination of the type of situation in which I judge 'This is red' with confidence, convinces me that in so doing I am discerning a certain element in my experience distinct from, and independent of, verbal rules, judging that this is similar to others I have experienced in the past, and that I have learned to apply that term to my experiences solely in virtue of that character in which I judge my present experience to resemble those past ones. That is to say, on analysis, the verbal rule which I must know to make such judgments, is revealed as a rule for the correlation of words with something other than words and verbal rules, and therefore to know this rule I must be able to discern this something independently of language.

The formalist's contention that words are indispensable to all mental processes, to all perceptual experiences as we know them, is thus seen to be erroneous. At the same time, however, it has been shown that he is correct, and moreover performing a useful service in pointing out something too easily and too often overlooked., when he maintains that language is indispensable to perceptual experiences of the type involving judgments such as 'This is red'. It is, therefore, the more unfortunate that the value of his analysis should be decreased by his failure to realise that there is a condition of these judgments distinct from language. This is doubly unfortunate since other thinkers may well be provoked into denying the

truth along with the error in his conclusions.

Very many would agree that the 'meaningulness' of given terms in certain situations involves some reference to the non-verbal, but there has probably been no greater disagreement than over that in which 'meaning' consists. Professor Ayer (11) has pointed out the fallacies in the more naive definitions. It is true he is discussing sentences and not single words in this connection, but fallacies similar in principle to those he points out, are equally possible in discussing the 'meaning' of words. Corresponding to the fallacy of defining the 'meaning' of a sentence as a fact (a definition which would make false sentences meaningless and is thus nonsensical) is that of defining the 'meaning' of words in terms of existents. This is an easy mistake to make if one concentrates one's attention on observation sentences. When I say spontaneously and with justice 'This pillarbox is red' I am saying something about an existent, it is therefore a natural conclusion that words 'mean' existents, their relations or qualities, that for instance 'pillar-box' 'means' a material object, 'red' a quality of material objects and so on. This view is refuted by the meaningfulness of the names of imaginary objects and those that have ceased to exist such as 'unicorn' and 'dodo'. I may indeed write a meaningful sentence which attributes a purely fictitious character to a purely fictitious object: e.g. 'A dragon is a winged and scaly reptile breathing red and green fire'; 'A winged unicorn is a star-eater'.

The other definition of meaning criticised by Professor Ayer is that which asserts a sentence's meaning to be a proposition. He objects that he can find no definition of 'proposition' apart from 'what a sentence means', and that the peculiar way in which propositions must exist, is never explained. The corresponding definition of words is that in terms of concepts or ideas, and against this equivalent objections may be raised. This again is an understandable definition, since we naturally conclude that words 'mean' what we 'understand' in using them correctly; and what is this, it will be asked, but the idea or conception they stand for? It is, indeed, true that meaningful words do stand for ideas or concepts, the error lies in supposing that an account of meaning can be given in terms of these alone.

Professor Ayer dismisses the general question 'What do sentences mean?' as pointless and misleading since it is unanswerable, there being no meaning common to all sentences; and doubtless he would treat the question 'What do words mean?' likewise. Now it is true that if the question 'What do words mean?' is regarded as analogous to 'What does "pillar-box" mean?' it admits of no answer. Yet this is not to say that no enquiry about the meaning of words in general admits of an answer, it merely asserts that a certain formula is misleading when it is used to express an enquiry about 'meaning' in general. There is a very real question as to what is involved in the meaningfulness of a word or sentence; for were it not possible to ask and answer this, it would be impossible to decide whether or not a term or sentence is 'meanfngful', and

this is a decision which is made as often as words are used, which is to say constantly. I shall try to answer this question; but owing to the ambiguity of questions of the form 'What do words mean?' I shall formulate the question I intend to try and answer as 'What makes a sentence meaningful?' or alternatively 'What are the conditions given which we ascribe'"meaning" to a term?'

It has been seen that the correct use, and hence the understanding of a term, in some contexts depends on the existence of a criterion other than a verbal rule. This is to say that there are occasions when the existence of something other than itself is relevant to the 'meaning' of a term. Furthermore the existence of experiences of a given type, either contemporaneously with or prior to, one's use of certain terms seems necessary if one is to attach 'meaning' to them. Thus it would not generally be said that a man blind from birth 'understood the meaning' of the term 'red' even though he used it correctly in transalting from twenty other languages into English or repeated correctly, as formulae learned by heart, 'English pillarboxes are red'; 'Red is one of the primary colours'; 'When tomatoes are red they are ripe'. Indeed even were he instructed correctly that if he pointed in a given direction at a certain time and repeated the formula 'This is red', he would be making a true assertion, and he used the formula so: he would still not be regarded as 'understanding' the meaning of the term 'red'. And, in case this might be regarded as an unfounded prejudice of the sighted, it may be useful to repeat here an assertion I once

heard made by a man blind from birth. He was engaged in conversation with an artist and maintained that he found it impossible to conceive how three-dimensional objects could be represented in a two dimensional medium, since this was something fundamentally dissimilar from any of his experiences. Here was a disinterested avowal (disinterested since he was not at that time concerned to support any particular theory of meaning) of great importance. For here was a man with a rare and crucial basis of comparison, since consistently with the established usage, there were some English terms he could correlate with certain experiences, others which he could correlate with none. And although as his ability to use them intelligibly in discussion witnessed, he understood the formal rules governing the use of these latter, he testified that these for him lacked 'meaning' in the sense in which those he was able to correlate with his experience, possessed it.

All this might suggest that the 'meaning' of words is definable in terms of experience. But an experience is after all only a type of existent and the definition of 'meaning' in terms of experience is open to all the objections against the wider definition in terms of existence. Not only are terms 'meaningful' in the immediate absence of any experience to which they might be applicable-e.g., 'Ripe tomatoes are red' remains 'meaningful' even at a time and place where there is nothing to which the term 'ripe tomato' is applicable; even if, at that precise moment, nothing exists to which the term is applicable, it and the sentence containing it are

are 'meaningful' but furthermore terms may be 'meaningful' when there has never existed any experience to which they would be applicable: e.g. unicorn, star-eater.

After careful consideration of the criteria by which terms are judged to be 'meaningful', I have come to the conclusion that although 'meaning' can be defined in terms of neither existents in general nor experiences in particular, yet neither can it be accounted for without reference to both. In order that 'meaning' should be attached to a term two things seem to be required: 1) an ability to conceive a given type of object (quality of, or relation among, objects) as a possible existent; 2) a decision to apply a given term to anything of this character should it ever be met with. For a term is said to have 'meaning' only when it has been decided that it should be applied to a certain type of thing should such ever exist; and a person is said to 'understand' it only when he knows the type of thing to which it would be proper to apply it (according to the rules of the language concerned) should such an one ever enter his experience. Thus a person is said to understand the term 'red' only when he knows the type of quality in virtue of which it would be correct to describe an existent by that term; he is said to understand the term 'pillar-box' if, and only if, he understands the conditions which an object would have to fulfil before this name might be applied to it in accordance with the conventions of the English language.

It thus becomes apparent why, and to what extent, experience is relevant to 'meaning' and 'understanding'. My blind friend's experience testified to the impossibility of conceiving something fundamentally dissimilar to any of one's experiences. But since one can attach 'meaning' to a term only by conceiving a possible existent to which it is made applicable, then in attaching 'meaning' or 'understanding', one is limited within the range of possibilities bearing some relation to one's experience. It is, on the other hand, apparent that there is no difficulty in attaching meaning to terms applicable to nothing within one's experience, or even to nothing existing at all, if the elements of the postulated hypothetical existents, have been met within one's own experience. Thus 'unicorn' and 'star-eater', are perfectly intelligible ~~terms~~ to me since they are definable in terms of words applicable to existents of a type I have frequently met. I have, for instance met horses, white objects, narrow objects, horns, golden objects and cone-shaped objects; the words 'white animal like a horse except for a narrow golden cone-shaped horn in the centre of its forehead' are therefore capable of expressing for me a possible character for an existent.

This account of 'meaning' so far as I can discover, is the only one that can satisfactorily allow for, and explain, the 'meaningfulness' of general assertions. These cannot be accounted for if the 'meaning' of words is defined simply in terms of existents since, as has been seen, they may remain 'meaningful' even when there is no existent to which the constituent terms are applicable (even indeed if there never has been and never will be). Yet on the other hand,

formal rules alone utterly fail to account for them and our interpretation of them.

There is one peculiarity of such assertions which makes them completely inexplicable on any view of meaning save in terms of hypothetical reference to existents: sometimes they may be regarded as expressing statements about existents, sometimes not. For instance, so long as there exists something to which the term 'ripe tomato' is applicable, the sentence 'Ripe tomatoes are red' is saying something about an existent, but if there should be nothing anywhere to which that term applies, then the sentence says nothing of any existent.

Once the process of attaching meaning to terms is recognised to be the adoption of a rule for applying words to existents of a specific type, should any such ever appear, the distinctive character of general assertions and their 'meaningfulness' becomes readily comprehensible. It can then be seen that every such assertion states, (in addition to a formal transformation rule) a semi-formal verbal convention in the shape of the conditions which the writer requires in an existent before he will apply a given term to it. To say, for instance, 'Ripe tomatoes are red', is to assert that one will apply the name 'ripe tomato' only to those fruit of a given kind having the specific quality in virtue of which we are accustomed to apply the term 'red' to objects. But a general assertion may also state something more: it may further assert that should anything having character A exist, it will also possess character B; specifying in addition, if it is precise, whether this

correlation is invariable or subject to certain conditions. Thus in saying 'Ripe tomatoes are red' I intend to assert that if and when there exists a fruit of a certain type, which further possesses the quality I call 'red', it also has the characteristics I call being sweet to the taste and digestible to eat.

When philosophers make general statements of the type: 'A cause resembles its effect'; 'A cause precedes its effect'; 'A cause is followed necessarily by its effect'; 'A cause is followed regularly by its effect'; they normally intend to make at least two distinct assertions, sometimes three. In the first place they are affirming a formal rule of substitution or verbal definition. Secondly they intend to lay down a condition, in the absence of which they would refuse to apply the term 'cause' to any existent or existing state of affairs. Many thinkers intend to say no more than this when they make such assertions since they regard themselves in so doing as stating the sole definitive character of a 'cause; that is to say they would be prepared to apply the term 'cause' to an existent in virtue of the one character they assert alone. Thus Kant was prepared to apply the term 'cause' to an existent in virtue of a necessary (in the sense of invariable) connection with its successor alone, while Russell and many other modern philosophers are (or have been at one time or another) prepared to apply the term 'cause' to an existent in virtue of its regular or heretofore unvaried connection with its successor. There are (and have been) thinkers, however, prepared to apply the term 'cause' to existents only in virtue of more than one

characteristic,: thus thinkers have decided to apply the term 'cause' only to events connected with their successors both as producer and invariable antecedent, while those thinkers who asserted that a 'cause' resembled its 'effect' were generally thinking in terms of one object capable of producing another so that they were prepared to apply the term to an object related to another both by resemblance and as producer. When such an one made an assertion of the type: 'A cause resembles its effect', he was asserting, in addition to the formal and semi-formal rules of definition, a correlation of characters such as that which I assert when I say 'Ripe tomatoes are red'; he was asserting, that is to say, that if and when any existent is related to another as its producer, it also resembles it.

It is evident from their discussions that those who make general assertions about 'cause' of the types listed above, have two additional convictions. They suppose in the first place that there are existents to which the term 'cause' is applicable according to the conventions they have laid down, and further they suppose certain specified existents to fulfil these conditions. They therefore suppose that in making such general 'causal' assertions, they are saying something about existents, just as I do in saying 'Ripe tomatoes are red' when there are existents to which the term 'ripe tomato' is applicable.

Most of the 'discussions about cause' are concerned with these latter convictions. For when one philosopher rejects another's definition of 'cause' he generally does so on the ground that there

is no existent to which the term, so defined, is applicable. Thus those who have rejected the definition of 'cause' in terms of 'necessary connection' and 'production' have always supported their contention with the argument that they find evidence of no existent to which the term,so defined, is applicable. More particularly, philosophers have criticised one another with respect to the specific types of existent to which they have judged the term 'cause' applicable, according to their conventions, on the ground that such a conclusion can rest only on an inadequate analysis of the existents in question. For example, Hume denies the existence of 'causes' defined in terms of 'necessary connection' and 'production' among external sensory phenomena, because he can find nothing among these to which the term, so defined, is applicable. It will appear below that philosophers have not always had the same type of existent in mind when they have 'discussed cause', and that the types of existent which they considered in this connection greatly affected the definitions of 'cause' they proposed. The primary interest of those who have 'discussed cause' has generally been the existents they have met in their own experience and those they have felt good reason to postulate beyond it. Thus Hume is interested in whether or not certain relations are discoverable among a certain type of existent, and so also is Russell in his discussions of cause, Leibniz in his denial of transeunt causality, and Kant in his account of the causal relation as a mental construct. Those who have been troubled with no 'causal problem' have equally been concerned to give an account of

some of the existents of which they have, or suppose themselves to have, evidence, in formulating 'causal' assertions; thus Aristotle, in formulating his theory of the 'four causes' supposes he is analysing relations he has discovered among existents

I have said (12) that I shall deal primarily with the question as to how the term 'cause' has been used, considering for the most part, its use by various influential thinkers. It is by now apparent that this involves not merely an account of the formal conventions in accordance with which they have used the term, but also what I have called the semi-formal ones. Since what they are primarily concerned to say is something applicable to actual existents, it is necessary to ask to what type of existent each would be entitled to apply the term 'cause' according to the conventions he adopts. This question, indeed, will require more attention than the former since a philosopher's verbal conventions are generally evident enough. Further, since it is impossible to discuss an usage of any term adequately without giving some account of its source, I shall try to give some account of how and why the various philosophers came to define 'cause' as they did.

Finally, since it is difficult, and contrary to all natural inclination, to consider the sentences formulated by any one without attempting to evaluate them I shall, as I remarked above (13) endeavour to say something relevant to the admissability or otherwise of the causal assertions I consider. And as the philosphers who formulated them supposed themselves to be saying something about the character of existents in so doing, it will be impossible

for me to attempt an approach at their evaluation without doing likewise. There are four possible conclusions to such an programme. It might be found:1) that there was no existent to which the term 'cause' was applicable in accordance with any of the known conventions though that one should exist is not intrinsically impossible; 2) that there were existents to which the term was applicable according to one or more, but not all, of the known conventions; 3) that there was no known convention in accordance with which the term was inapplicable to any existent; 4) that one or more of the conventions laid down conditions incapable of realisation in any existent.

At one time Russell was of the opinion that 'the term cause should be extruded from the philosophical vocabulary' (14) This is a conclusion which might be reached whether or not it was judged that there were, or could be, existents to which the term were applicable. If there could be no such existent clearly the term should be discarded since its use establishes a false conviction; and should there be in fact no existent to which the term is applicable, though there might be, we should stop applying it to existents as we do, though we could not altogether dispense with it or its synonyms since one must have an appropriate term in order to deny the existence of a certain type of thing. On the other hand, even though there were existents to which the term is applicable according to one or more of the customary conventions, it might still be desirable to discard it in order to avoid the

confusion created by a variety of conflicting definitions, adopting new terms to fulfil its functions. Alternatively this latter course might be found to create greater confusion than it dispelled.

It is thus apparent that there are numerous subjects of discussion involved in the study I have undertaken; nor can one person hope to deal conclusively with them all. I hope, however, that I may at least help to elucidate them. If I can discover but some of the relevant questions to ask concerning them my work will not have been in vain, since so many philosophical confusions and deadlocks have arisen as a result of asking the wrong questions or formulating the right ones in a misleading manner.

(ii) Entailment and Deduction.

Aristotle was the first to formulate conventions in accordance with which one set of symbols is derivable from others. He was not, of course, the first to recognise the possibility of manipulating symbols consistently with a substitution rule; the first person to do this was he who first formulated an argument resting on the assumption of entailment. (I can think of no argument which does not rest on this assumption, for even if one argues inductively to the probability that all A's are B from the consistency of this conclusion with the available evidence, one is thereby assuming a conclusion's consistency with the available evidence to entail the probability of its truth). Aristotle, however, was the first to analyse such a substitution process and to formulate the conditions necessary to its consistency. The (at least implicit) recognition of the possibility of processes of this type is one thing in which all philosophers have been forced to agree.

The man in the street, Aristotle, and very many other philosppers are further agreed in a far more daring conclusion. For they suppose both that intrinsic connections may be found which are independent of linguistic conventions, and that linguistic substitution rules may be so correlated with these that they may be expressed by the manipulation of terms in accordance with those rules. Thos holding this view thus suppose not only that separate sets of symbols are capable of asserting truly something concerning existents which is other than a rule for manipulating symbols, but that by deriving one sentence from another in accordance with a verbal convention it is possible to show the dependence of the truth of one assertion on that of others.

In this connection the analysis of 'meaning' given above should be remembered. For just as it is not customary to attach 'meaning' to a term simply by correlating it with an actual existent, instead a rule being constructed to the effect that the term should be applied to existents of a given type should there ever be any such; so those who regard verbal manipulation in the manner outlined above do not suppose its purpose limited to expressing the relation of one piece of actually true information to another. Rather do they suppose formal substitution rules capable of defining a process which can express that <u>if</u> A and B should both be true <u>then</u> C must be also. And it is in virtue of such a general hypothesis that a verbal deduction is judged relevant to the truth of any assertion given that of others.

If a philosopher uses linguistic substitution rules intending thereby not simply to amuse himself by manipulating a calculus, but supposes himself in this capable of reaching or defending a conclusion which may be relevant to existents and which asserts more than a verbal rule; he in effect supposes linguistic manipulation capable of this function.

Any philosopher who does not think this assumption justified, if he is consistent, is thus limited to stating merely those results of analysis of the observed whose defence requires no appeal to entailment of any kind. He is thus debarred even from induction insofar as this relies on it.

Not only have many philosophers supposed 'causation' a non-linguistic entailment; but most have in effect assumed at least so much

entailment among existents as to justify their supposing conclusions concerning them, which assert more than linguistic rules of their implications, may be supported by deductive arguments. Before examining either the claims for 'causation' as entailment or the arguments with which philosophers have defended this or other views of 'causation', it is therefore necessary to discuss briefly whether or not entailment is conceivable or discoverable outside the bounds of purely linguistic convention, and whether linguistic implications can be instrumental in defending conclusions asserting more than such conventions and their results. Here again my discussion, as necessarily brief, cannot claim to be exhaustive; but merely to indicate the lines on which I would try to defend my views.

It is at once evident that I have, in the preceding pages, assumed a certain degree of verbal manipulation instrumental in defending views concerning existents other than symbols. And I know of no philosopher who has not regarded it capable of defending conclusions concerning some existents. In this connection it will be well to remember a possible confusion which may arise from the adoption of Carnap's usage in applying the term 'pseudo-object - sentence' to those sentences which though claiming to assert something of existents other than words, in fact refer only to words. This usage is apt to obscure the fact, pointed out by Carnap himself, (15) that what he calls 'logical sentences' (i.e. those dealing solely with symbols and their correlations) are also 'object sentences' since they make assertions about words, the objects of logic. For when a distinction is made between 'object-sentences' and sentences about words, it is easy to

forget that these latter are as much concerned with existents as the former; that written symbols are physical objects and the utterance and manipulation of words, occurrences. It may therefore be overlooked that discussions and demonstrations concerned with the characters of symbols and with principles in accordance with which they may be, or have been, manipulated are as relevant to existents as are those which claim to prove something concerning sense data or chairs and tables.

It should be apparent that it is impossible to discuss the objective application of verbal manipulation without assuming it to be true; any doubt on this subject may be promptly dispelled by an attempt to formulate such a discussion. It is, therefore, incapable of either valid proof or valid disproof by means of verbal arguments. It may, however, be useful to consider some views relevant to this assumption which have been maintained, as also to examine some of its applications and, in particular to consider the possibility and conditions of non-verbal entailment.

It has been maintained that 'implication' is a relation discoverable among symbols alone. If a thinker decides to apply this term solely to the derivability of one set of symbols from another, then clearly he must say this. Further, since the term is generally used in this sense today, the adoption of this usage is to be recommended in order that confusion may be avoided. This decision, however, does not render the discussion of non-verbal entailment unnecessary, for it leaves unanswered the question whether or not the character which thinkers have sought to ascribe

to existents other than sentences in asserting that they 'entail' one another, is in fact discoverable in any of them.

It might be supposed that in considering this question, I am concerned with nothing other than the central problem of causality as it has appeared to thinkers since Hume, and that in discussing it here I am blatantly departing from the order of discussion I have myself laid down. It will therefore be well to contradict this at once, particularly as it reflects a confusion which invalidates much of what has been said on the subject. The major 'causal' dispute since Hume has raged around the question whether or not there is a relation of necessary connection between the existents commonly said to be 'causally' connected; and more generally, whether a relation of necessary connection of the type ascribed to 'causes' and 'effects' is possible among existents. Now the relation of necessary connection with which modern 'causal' discussion is concerned, is one obtaining between events; one in virtue of which it may be concluded with certainty that, given a specific type of event A, one of the type B must occur. There seems no reason to suppose that if necessary connection other than that depending on linguistic rules is possible at all it must be of this type alone. It cannot, therefore, be assumed that the answers to the question 'Are relations of necessary connection, independent of verbal convention, possible among existents?' and 'Is a necessary causal connection possible?' are identical. Neither can it be assumed that the denial of the existence of necessary causal relations is a denial of the existence of any necessary connections

independent of verbal rule. If no type of necessary connection other than that dependent on linguistic convention is possible then clearly no necessary causal connection is possible, and if no connection of the first type exists none of the latter exists either; but the converse does not hold. There is no contradiction in supposing that, though there are no necessary connections of the type commonly called 'causal' there are some which are independent of verbal rule.

Today very many thinkers affirm that no fact can be necessary, that necessity simply may not be ascribed to existents in any sense. This is a misleading assertion since those who make it are convinced of the possibility of implication dependent on verbal rule, and this, as has been seen is as much concerned with existents as any relation between events, or their qualities, could be. It is of course a relation of a very different kind from those generally attributed to non-linguistic existents, and no doubt it is this difference which such thinkers are chiefly concerned to point out. But this difference does not make linguistic implication any less concerned with existents, nor justify an use of language suggesting that this is so. The philosophers mentioned above must therefore be understood solely as denying necessity to all relations other than those dependent on linguistic convention; and they lay themselves open to criticism insofar as they fail to make this explicit.

It is clear that if linguistic implication is the only type of necessary connection possible, the postulation of any other is mistaken. Although, however, this view of necessary connection is

very widely and strongly held, I have been able to find absolutely no ground for it at all. I strongly suspect that the thinkers holding it suppose their position established by Hume. This illustion is assisted (and apparently shared) by Hume himself, who affirms unequivocally that he finds no relation of necessary connection among his impressions. It would be out of place to discuss his argument here, but it must be pointed out that in discussing and maintaining this he in fact directs his attention solely to those events which may be called 'causes' and 'effects' according to his usage, and that therefore his analysis can prove only that no necessary relations exist between these.

The current attitude is well expressed by Professor Waismann in the series of articles entitled 'Synthetic Analytic' appearing in Analysis (16) In the course of these he examines some experiences, other than linguistic manipulation, in which we seem to discover necessity; these experiences he says are very puzzling since in them we seem to find the inevitability in virtue of which we are wont to ascribe necessity, yet at the same time it is argued that this cannot be so since they are 'facts' and so cannot possess necessity. Now a thinker is perfectly at liberty to define 'fact' so that nothing necessary may be so-called; but the attitude that would dogmatically deny necessity to anything other than verbal manipulation, with the assertion that as such it simply could not possess it, even in the face of evidence to the contrary, would seem to resemble nothing so much as that of the Aristotelians who refused to look through Galileo's telescope maintaining that, whether

they could be seen or not, Jupiter could possess no moons since this was contrary to the teaching of Aristotle. This, of course, is not to deny that necessity may be mistakenly attributed; clearly any claim to, or superficial appearance of, necessity would require careful examination. It is merely the refusal to admit the possibility of necessity, or evidence for it, under these circumstances, which is here in question. Waismann gives as the ground for this attitude the conviction that the criterion of 'facthood' is verifiability, and that the possibility of verifiability involves the possibility of disproof. If this is so, clearly every 'fact' must be capable of being other than it is, that is to say, it must be contingent. Throughout this argument runs the ambiguity concerning the term 'fact' noted above and the consequent failure to remember that words and verbal manipulations are themselves existents. Further the user of this argument fails to notice that in order for it to prove what he wishes it to, the character of verifiability must entail that of contingency apart from the correlation of words used to describe them, i.e. that it assumes possession of this one character entails possession of another.

Apart from this basic objection, common, as has been seen, to all demonstrations seeking to prove or disprove non-linguistic necessary connection, it seems evident that the major premise of the argument is completely unjustified and must rest on a confusion. For there seems no reason to suppose that what is experientially testable must be capable of being other than it is; if it were

inherently impossible for pillar boxes to be any colour other than red, surely this would not prevent us from discovering that they are red in precisely the same manner in which we discover it today. Surely the possibility of an alternative is required, not in that discovered, but in the experimental conditions for its discovery. There seems no reason to suppose I could not see a pillar box was red even though it could not be otherwise; but I could not discover it to be red by the simple experiment of looking at it, unless I were able to perceive not only red but other colours as well. If my eyes acted as coloured spectacles so that everything appeared red whether it was or not, I should not be able to discover by experiment whether any thing were red or not.

Furthermore, the minor premise is at the least, sufficiently ambiguous to be misleading. Reichenbach has pointed out the ~~inadequacy~~ ambiguity of verifiability as a criterion of meaningfulness (17); much of what he says in the course of this discussion is relevant to the definition of 'fact' in terms of verifiability. If by verifiable is meant 'verifiable within the conditions of human observation', then many of the postulated facts of science and commonsense must be rejected. Even if verifiability is made merely the criterion of a justifiable postulation of possible existence, the difficulty still remains. If I were not justified in postulating as existent anything whose existence is untestable by human means then I could have no justification in supposing the other side of the moon to exist, nor the great heat which I attribute to the sun. If such a criterion is not to exclude many

known facts and condemn many recognised assertions of science, it must be made much wider: it must take the form 'If anything exists some condition must be possible under which it would be perceptible to some possible existent!' Such a definition is not only circular, since it must assume that for which it claims to be providing a criterion, namely that which justifies the postulation of x as a possible existent; but is, in effect, none other than a restatement of the traditional criterion of logical or intrinsic possibility. To call it a verifiability criterion suggesting, as this does, that it is something different, would thus be extremely misleading. Further the above definition would require it to fulfil a function never demanded of it by the traditional rationalist, one of which it is incapable. For if direct humanly possible verifiability is too narrow a criterion for the practical purpose of accepting or rejecting x as a possible existent, that of conceivable verifiability is far too wide since it takes no account of the limiations laid down by what actually exists, consistency with which is a condition of co-existence with it. The only practical verifiability criterion which could be adopted is that in fact adopted by the scientist, that which admits x as a possible existent if it is either directly observable under human conditions, or inferrible from that which is. This is by no means a simple criterion, however, since before it may be applied with justification it is necessary to enquire under what conditions the unobservable is inferrible from the observable. Many philosophers have denied that a valid process of inference from the

observed to the unobserved is possible at all. One would not therefore be justified in accepting such a criterion without examining these problems very carefully and satisfying himself that such inference is admissible. Thus although empirical testability seems to be an indispensable condition of the acceptability of any hypothesis, this is seen to be by no means so simple and straightforward a contention as might at first sight appear. Hence any argument resting on it as a premise can be justified only if this is elucidated and itself justified.

It will be useful at this point, to examine experience to see whether in fact, any necessary connections may be found in it; examining a few phenomena in which they seem to appear.

A friend of mine once related how she was involved in a fierce argument as to whether a certain note which had been played was A sharp or B flat and how both disputants suddenly realised with amusement that A sharp and B flat are 'the same note'. Is there not a 'must', a necessity, here? Can A sharp fail to be also B flat, or B flat fail to be A sharp? It might be objected that we have here simply a duplicity of names, that we have decided to give two alternative names to a certain sound and that therefore whenever we are justified in using one we are justified in using the other. This account is plainly inadequate since the two names in question are not synonyms:. the term 'A sharp' indicating a certain relation between the note named and A, 'B flat' indicating another relation between it and B. With more plausibility it might be urged that we have simply learned to relate the notes in terms of an arbitrary

order which we have constructed, that there is no relation between A, A sharp, and B save that of succession in this standard order, and that therefore there is here no necessity save that dependent on an artificial convetion. This conclusion, however, is refuted by the evidence, noted above (18) provided by the four year old's capacity for detecting the relations between musical notes independently of any knowledge of such a standard order. Certainly these relations can be described only in terms of such an order, but they are there to be described and are not produced by the description. Were, for instance, the notes named differently but the standard order adopted nominally the same (i.e. A sharp still being situated between A and B though the sounds called A sharp, A and B were different from those we so name) then to say that A sharp was situated between A and B would not be to assert the same relation as would those words understood according to the classical western usage.

The following seems therefore the only possible account of this phenomenon consistent with all the available evidence. The order given the notes in accordance with western notation, has been constructed in virtue of relations inherent in the notes themselves, being as it were an implicit order waiting to be discovered rather than an artificial construct. And it is in virtue of its intrinsic character and theirs that the sound we call severally A sharp or B flat is related as it is to A and B respectively; and, so far as I can see, having that character, it cannot fail to be so related. Further A and B are such that no note could be related to B in the

manner we call being a semitone below it, without at the same time being related to A in the manner we call being a semitone above it; that is to say the sounds called A and B respectively are of such a nature that the character which a sound requires if it is to have the relation to A which we call being a semitone above it, is that which inevitably gives it the relation to B we call being a semitone below it.

Here then are phenomena, sense date, whose natures are such that certain relations between them are inevitable: phenomena whose being of a certain character renders it impossible for them to fail to be related in a given manner. But is not this precisely what those who maintain non-verbal entailment assert, that there are (or may be) existents of such an intrinsic character that this or that cannot fail to be true of them or others. It appears then that such entailment is not only possible but actually discoverable among phenomena. Nor is this instance unique: precisely the same is true of the relations between different shades of the same colour. Here again we order them in a certain manner describing these relations solely in terms of that order; and again that order is constructed in virtue of those relations, and it is in virtue of their intrinsic natures that one shade may be correctly described as darker or lighter than another according to the conventions of the English language. Moreover each shade is of such a nature that a different relation of degree holds between it and each of the others respectively; only one such relation being possible between itself and any given one of these, the existence of this

relation being inevitable in virtue of their respective characters.

But these are not the only types of phenomena in which necessity is discoverable; it may also be found in any variegated visual field, be this what is called 'a view of a landscape', 'a view of a building's interior', the sight of a picture', 'the content of a dream or an optical illusion', 'the sight of the disposition of the pieces on a chessboard', or any other possible type whatsoever. A sense-field of the latter type will perhaps serve most clearly to illustrate this. I have only to experience the sight of pieces disposed on a chessboard to perceive that the mutual relations of the coloured shapes I attribute to the 'pieces' are inevitable once given their several relations to the set of visual sense I attribute to the 'board'. It might perhaps be objected that here there is no true entailment since there is no true differentiation; that the positions of the pieces may be described either in terms of their separate relations to the board, or of their mutual correlations, each set of relations representing solely a different manner of describing the same thing. Now it is perfectly true that the two sets of relations do serve as alternative methods of describing the same thing, but this does not make those two sets of relations one, rather does the possibility of regarding them as alternative means of describing the same thing rest upon their difference. It would certainly seem to require no more than inspection of the phenomenon to discover that while the position of the black queen might be described in terms of either its relation to the board or its relations to the other pieces on the board; its

being related to the board in one way is something completely different from its being related to the other pieces in other ways, there is clearly here not only a difference of relations but also a difference between the terms related thus variously.

The necessity involved is clearly provisional; there is no reason to suppose that any of the pieces could not stand in any of the 64 relations to the pattern of the chessboard possible within it. What is apparent from simply experiencing the phenomenon is that, given a number of pieces each of which having a certain distinctive relation to the pattern of the board, they cannot but be mutually related in one specific way and none other; that is to say, mere inspection of the phenomenon reveals that the occurrence of one set of relations makes the contemporary occurrence of another specific set inevitable.

There is a common assumption about 'experience' or 'the world' (whichever term is preferred) which it will be useful to consider here since it postulates a condition given which non-verbal entailment would be discoverable among existents. I shall not here discuss its justification; that would be premature since it involves the postulation of the uniformity of nature or some equivalent principle of the constancy of experience, a question which will be more appropriately discussed below. (19) I shall examine it here solely with a view to revealing the conditions of non-verbal entailment it states; whether it is in fact ever fulfilled or not being entirely irrelevant to this.

It is commonly held that there are existents which persist through some length of time, having specific relations to each other which remain constant so long as those so related exist. Cities, lakes, mountains, and continents are commonly regarded as existents of this type. Should it be indeed true that Glasgow, Carlisle, and London are existents persisting through time and standing in a constant spatial relation one to the other, then it is clear that given some further conditions, there would be an inevitability about certain events. Granted that I am likewise a persistent existent, though a mobile one; then it is clear that if, setting off from Glasgow. I travelled continuously along a given slightly curving line from a given point on a straight line running through the heart of Glasgow. I could not fail to arrive first at Carlisle and then at London. Similarly, if I left London travelling back along that same line, I could not fail to arrive first at Carlisle and then at Glasgow. Not only could I not fail to reach both Carlisle and Glasgow if I travelled thus from London, but I could not fail to reach them in one order only: it would be quite impossible for me to arrive first at Glasgow and then at Carlisle. It is evident that it is the postulated relations between London, Carlisle, and Glasgow which would render the occurrence and order of these events inevitable under the specified conditions. The persistence of their terms and the constancy of the relations themselves are indeed necessary conditions of this result as indeed is my persistence and continued motion in a certain direction; but though these latter conditions were fulfilled, the relations alone being different, then instead

of my moving continuously in this direction inevitably resulting in my arrival first at Carlisle and then at Glasgow, its possibility would be completely excluded.

This hypothesis is doubly interesting. In the first place it reveals the possibility of conditions which would determine the character and order of future events (that is to say, would render the occurrence of events of a given character and in a given order inevitable); revealing the character of one type of condition which would fulfil this function. Secondly it is, in effect, ascribing a certain specific and persistent structure to one part of the universe, its consideration therefore reveals the importance of structure. Clearly it is impossible to travel in a given direction from London, in the universe of commonsense, without reaching Carlisle and Glasgow (in that order) precisely because that section of the universe is constructed in such a way that one cannot fail to attain that result if one fulfils that condition. It is thus evident that if any persistent structure is attributable to the universe or to any part of it (or, if you will, to experience) then, given certain further conditions, the character and order of some future events will be determined. One of Kant's contentions is thus seen to be justified; (it will be seen below (20) that the second and more daring of the two basic premises on which his theory of causality rests is unjustifiable, but this to anticipate).

In conclusion I shall examine the conditions which would have to be fulfilled if a typical verbal implication were to serve to express a non-verbal entailment. For convenience, I shall take

as my example a deduction of the syllogistic type, and this for two reasons. In the first place this is the form of deduction most commonly used on the assumption that it serves to make explicit, demonstrate, or argue from, such entailment. Secondly, it is a form of deduction so widely discussed that it requires relatively little introduction and explanation. For simplicity's sake I shall take as my example a syllogism in barbara. (21)

It has been supposed by traditional logicians that an argument of the form:

All M is P
All S is M
therefore All S is P

is capable of expressing the entailment of the truth of one piece of information concerning something apart from an arbitrary convention and its implications, ~~from~~ by that of two others. This is the implicit assumption of all who use arguments of this form as a means of reaching or justifying conclusions they regard in this light: and these include both plain men and philosophers. (To describe the syllogism as capable of expressing the entailment of A's truth by that of B and C is not, of course, to deny that a syllogism having false premises and conclusion may be valid in form).

In order that this assumption might be justified not only would premise and conclusion (consistently with the same usage) have each to express information of this type, but the information asserted by the premises must be such that if it were true that asserted by the conclusion could not fail to be true either. To discover whether this may be so I shall examine a sample valid

syllogism as follows. First I shall consider separately the sentences forming premises and conclusion, asking what they are ordinarily intended to assert; then I shall ask whether, and in what way, the truth of the premises is relevant to that of the conclusion.

Before doing this, however, I must say a few words about the use of the term 'truth' in this context. 'Truth' has been the subject of as much philosophical debate as 'causation', and I do not wish to add to an inevitably lengthy thesis by involving myself in those discussions here. But I cannot, without considerable practical inconvenience, refrain from using the term altogether and am thus forced, in order to avoid misunderstanding, to make explicit my meaning when I do so. For convenience I shall adopt what appears to be the commonsense usage (an usage in effect implying some form of the correspondence theory), since this is the most familiar and that usually adopted by philosophers whatever their theories on the subject. And I shall try to make this explicit by stating the conditions under which I should describe different types of assertion as 'true'. This task is complicated by sentences of the same form being sometimes variously interpreted by different philosophers, as for instance those ordinarily described as having reference to 'physical objects' are differently interpreted by phenomenalists and those maintaining a representative theory of perception. Such a sentence might thus be regarded as asserting something true on the one interpretation and something false on the other.

When a sentence of the form 'A exists' or 'There is an A', is regarded as asserting that, given certain conditions, certain experiences will occur and/or that certain experiences will have occurred if certain conditions have obtained; I shall describe it as true if I suppose those experiences will occur and/or will have occurred under the specified conditions. And if the sentence is supposed to assert this to be only probable I shall say it is true if I suppose it reasonable to expect those experiences to occur and to have done so under those conditions, even though one cannot be certain of this.

If, however, the subject term of a sentence of the form 'A exists' or 'There is an X (i.e. a something) such that X is A' is supposed to designate a sence datum or continuant (to borrow Johnson's term), I shall regard it as asserting something true if I suppose there is an existent such that, according to the conventions it exemplifies, I could apply to it the title 'A'. Thus having decided to apply the term 'toothache' to a certain kind of pain, I should unhesitatingly assert the truth of 'A toothache exists' or 'There is a toothache', were a pain of that type present to my experience. (Clearly I cannot enter here into either the analysis of such sentences or the problems involved in treating existence as a predicate. I can only remark that, while Kant seems clearly justified in denying that the statement that a given number of thalers exist makes a distinctive assertion about the character of being that number of thalers, yet sentences such as

'There are blue sense data' or 'There are men-eating tigers' (understood on the commonsense interpretation) seem clearly capable of making some sort of distinctive statement which may be true in the sense outlined above).

Many of the statements used by both plain men and philosophers are of the form 'A is B'. (22) Sentences of this form always assert a convention governing the substitution of terms. When such an one is treated as asserting no more, I shall regard it as asserting something {true' if it is indeed consistent with the substitution rules of the language or calculus to which the person using it intends to refer.

Generally, however, as was suggested above (23) when sentences of this type are formulated they are supposed to have some relevance to actual or possible existents.

When these are intended to assert an invariable correlation between experiences of given types or certain qualities or relations discoverable in experiences, given certain conditions; I shall regard ~~it~~ them as true if I suppose those correlations to hold under those conditions. And again, if I supposed ~~the~~ a sentence to assert the invariability of those correlations as only probable I should regard it as true if I supposed it reasonable to expect them to hold, though not absolutely certain that they would.

When the subject term of a sentence of the form 'A is B' is supposed to designate an actual sense datum or continuant (or actual sense data or continuants of a given type) I shall regard ~~them~~ it as asserting something true only if there is something

exhibiting the quality or relation the predicate is intended to ascribe. Thus I shall say I am asserting something true when I say 'The brown patch is to the left of the green one' if I am experiencing a visual field in which coloured patches of the types I have decided to call 'brown' and 'green' occur such that a 'brown' one stands to a 'green' in the relation I have decided to describe as 'being to the left of'. When sentences of this form are intended to assert generalisation I shall call them true only if I suppose there are existents to which both the subject and predicate terms are applicable according to the conventions used by their authors while there is none to which (according to those same conventions) the subject but not the predicate term is applicable. Thus I shall say I am asserting truly 'All the blue patches in my visual field are round' if I am experiencing a visual field in which every coloured patch of the type I have decided to call 'blue' exhibits the shape I have decided to call 'round'.

It has been observed that generalisation may be intended to record not merely correlations which have happened to have occurred constantly, but also some which cannot fail to occur. 'Lions are carnivorous', for example may be intended to assert that whenever, and if ever there exists an animal of a certain specific type it will always be found to feed naturally on flesh. Often, indeed, such sentences have been intended to assert that to be an existent of a given type is to be such as inevitably to be of a specified character, or to stand in a certain relation to some other existent (either unconditionally or under specified conditions.)

Clearly it is irrelevant to assertions of these two latter types whether there exists anything to which the subject term is applicable. I should call an assertion of the first type 'true' were I convinced that if anything existed of the type specified by the subject term, this would always exhibit the quality or relation to which the predicate is intended to apply. One of the second type I should regard as 'true' were I convinced that exhibiting the quality of relation the predicate is intended to assert is intrinsic to being an existent of the type specified by the subject term (absolutely or under given conditions, as the assertion was conditional or not).

For convenience I shall follow the common practice, and when not specifically concerned with possible differences of interpretation I shall treat as generally accepted as 'true', assertions such as that 'cows are ruminants' or that Edinburgh is north of London; since they are generally treated as asserting hupotheses about experience which are ordinarily accepted as justified, and for practical purposes they need be regarded as asserting no more.

To return now to the syllogism and its relation to non-linguistic entailment; I shall take as my example:-

Every green figure in this pattern is preceded by a red one,

Every triangle in this pattern is green,

therefore

Every triangle in this pattern is preceded by a red figure.

As has been already observed (24) it is impossible to discuss anything without using symbols, and deriving sets of them one from another.

Thus any discussion of a syllogism either as a whole or by separate consideration of the sentences forming its premises and conclusion, will inevitably consist itself in deriving sets of symbols one from another. It will therefore be difficult to distinguish thereby between the symbols and their correlations and what (apart from verbal correlations) they purport to express. It is, therefore, difficult thus to substantiate any conclusion concerning the relevance of the verbal implication to any non-linguistic entailment. It is far less difficult, however, to discover this for oneself, particularly when, as in the present instance each of the sentences making up the syllogism is intended to express a situation containing elements which have been, or can be, directly experienced. For then it is easy enough to imagine each of the situations the individual sentences purport to express and thus to perceive whether and how these are related one to the other. I can only try to describe this experiment and its results and hope that those who wish to judge my conclusions in the matter will test them by making the experiment themselves.

It is not difficult to imagine a situation given which the sentence 'Every green figure in this pattern is preceded by a red one' would ordinarily be said to be true. It is a visual experience in which an arrangement of coloured shapes is seen, every shape of the familiar colour we ordinarily call 'green' being preceded by one of that which we ordinarily call 'red' (precede being here understood in the sense in which it is true to say 'a precedes b' when referring to the symbols a b written thus).

It is equally easy to imagine the situation which would generally be regarded as rendering true the sentence 'Every triangle in this pattern is green' when the occurrence of the phrase 'this pattern' in this and the former sentence is intended to indicate that both refer to, and are verified by, an identical situation. One has now to imagine, within the arrangement of visual data pictured before, shapes of the type commonly called 'triangular' each of which is of the colour commonly called 'green'. One has only to make this experiment in imagination, forgetting all words and their correlations, to discover that one cannot do so without imagining the situation which would be said to verify the sentence 'Every triangle in this pattern is preceded by a red figure'. For this exercise in imagination reveals that the situation which would be said to verify the premises of our syllogism is so constructed that it cannot fail to be such as to be said to verify that forming its conclusion. It is at once evident that the situation postulated by the conclusion is that postulated by the two premises; it cannot therefore be said to be entailed as something distinct from and additional to this. But this does not argue absence of entailment. The entailment involved is evidently internal to a single situation. The feature of the situation expressed by saying 'Every triangle is preceded by a red figure' is quite distinct from those expressed by saying 'Every green figure is preceded by a red one' and 'Every triangle is green'. The entailment lies quite evidently in the impossibility of its exhibiting the two latter features without

exhibiting the former: the inescapable fact that in order to exhibit the two latter features the situation must be so constructed that it exhibits the former.

If a particular syllogism reflected a non-linguistic entailment purely by coincidence, this would not justify the traditional view of a syllogism as a means of reaching and justifying conclusions concerned with more than verbal rules. The syllogism was of importance in the eyes of Aristotle and subsequent logicians precisely because they supposed its form capable of expressing a general principle of non-verbal entailment.

When considering a general principle concerning a non-verbal feature of existents it is less easy to escape from words than when considering a particular non-verbal situation. For one can neither imagine a general principle nor conceive it as such, without the use of symbols. Consideration of the example just examined, however, shows how imagining or perceiving a particular non-verbal entailment, independently of symbols, may reveal general principles underlying it. It was seen that one had but to imagine a situation exhibiting certain features asserted by the sentences in question, to perceive their inter-relation. Inevitably any situation so pictured is individual, but it does not require the use of symbols to reveal to the person imagining it that what he imagines in it are features of such and such specific characters. Thus a child or savage playing with coloured shapes may, before learning to apply any symbol to it, redognise triangularity as a

specific character which some share and which distinguishes them from others, just as one may recognise the characteristic shapes of the pieces of a jigsaw puzzle without ever thinking of applying symbols to them. Nor does he need symbols to discover that the relation he perceives in the imagined situation is one between those features insofar as they are specific. So, for instance, I may see, merely by looking at them, without so much as having any symbols in my mind, let alone manipulating them, that two pieces of a jigsaw puzzle are so shaped that they cannot but interlock. Thus direct observation of the imagined situation, divorced from symbols, leads directly to the conclusion expressed verbally by the sentence 'Whenever a pattern is such that every triangle in it is green and every green figure in it preceded by a red one, then every triangle in it is preceded by a red figure.

Similarly, it seems clear that underlying the above example and similar types of entailment is the general principle that if everything exemplifying a given characteristic X also exhibits another Y, and any individual, species or group exemplifies X; then this latter must exhibit Y.

It might perhaps be objected that this 'general principle' formulates not a type of entailment but simply two different ways of saying the same thing, the sentences 'All X is Y'and 'If anything is X it is Y' being equivalent. But this is not so, being merely suggested by the difficulty of using completely general

terms clearly. The minor premise and conclusion do not assert a hypothetical generalisation, but each makes a categorical assertion about a given individual, species or group (actual or possible) asserting something distinct from that stated by the major, moreover the two former may each state something quite distinct from the other unless the major is true. Thus, for example, that all men are mortal is distinct from both Socrates being a man and his being mortal; while to assert his humanity is not to assert his mortality unless it is true that all men are mortal. And that to assert the minor is to assert the conclusion if the major is true is precisely the essence of the entailment.

It is indeed true, as suggested above, (25) that the conclusion states only something asserted by both premises together so that it is in fact superfluous to affirm the conclusion after having asserted the premises unless one merely wishes to make explicit what they state in conjunction. But, as suggested in the previous paragraph, the importance of the syllogism lies just in its expressing that to assert both the premises truly is in effect to assert truly the conclusion, and hence that to assert both premises is to assert the conclusion.

If, starting from the general principle expressed by the syllosism, one tries to justify it, one has but to perform the experiment of trying to construct in imagination a situation which contravenes it to discover that here is an impossibility that goes deeper than verbal contradiction; one that lies in

the actual conditions of construction, or if you will, in the characters of the elements one is trying to combine.

As with the processes syllogistic logic recognises as valid, so with those which it rejects: this rejection rests on the conviction that (according to ordinary usage) it is impossible to formulate a rule, in accordance with which, from sentences of given forms another can be derived such that if the former express true assertions so must the latter. And the justification of this is again discoverable by an experiment of imagination or observation.

Take, for instance, the argument:

All the triangles are green

Every third figure is green

therefore Every third figure is a triangle.

It is quite possible to imagine, or construct, a set of circumstances which verifies both premises without verifying the conclusion. And, moreover, consideration of such a set of circumstances makes it clear that this is not accidental, but that the mere common possession of a characteristic by two types of existent does not prevent their differing fundamentally in any other respect.

The question whether the syllogism can be a means of discovering new information has been discussed ad nauseam; there is, therefore, no need to enter fully into it here. It is, indeed, sufficiently clear that unless the truth of the major premise can be established independently of that of the minor, it can be known only subsequently to the conclusion. Thus if I can discover that all men are mortal only by so examining every man, or, per impossibile, the death of every man that I learn of Socrates

mortality in the process; then clearly I cannot discover this latter as new knowledge by combining the information that all men are mortal with the knowledge of Socrates' humanity.

It is possible, however, that one might discover the truth of a major premise without discovering that of the minor conjoined with it in a valid syllogism. Were this so, conjunction of knowledge of the truth of one of these premises with that of the truth of the other could give information which one might otherwise lack. I might, for instance, discover being human of its nature entailed being mortal. Could I do so I might well discover it without knowing whether Socrates were man, angel, statue, or fictitious character. Were this so, subsequent discovery of his humanity would give me the additional knowledge of his mortality; knowledge moreover which I might not have attained without knowing both that all men were mortal and that he was a man. Or, again, I might discover, by complete enumeration, that all the occupants of a certain room were blue-eyed, without knowing anything more about them. If I then learnt that one of them was X's brother (or the author of Y), the addition of this to my previous findings would give me the further knowledge that X's brother (or the author of Y) was blue-eyed.

Remarks similar to those applied above (26) to the syllogism regarded as expressing non-linguistic entailment, apply to the question of its role as a means of reaching knowledge. To know the truth of both premises is to know that of the conclusion so that, in this sense, the latter is nothing new. Yet the syllogism

is capable of exemplifying, or expressing, a real progress towards knowledge, the essence of which consists in discovering in the conjunction of two distinct pieces of knowledge, information which could be gained from neither alone.

Whether or no a syllogism is capable of exemplifying or expressing a process towards knowledge in any given instance, my previous discussion should have served to make it clear that it will always be capable of making explicit, conditions given which it is legitimate to postulate a given conclusion as true. Hence, when the truth of the premises is accepted, it will always serve to justify belief in that of the conclusion. Both these are undeniably useful functions: plain men and philosophers both need at times, to be reminded, or to remind themselves, of the implications of their beliefs; and to be capable of justifying them.

Moreover the syllogism's ability to fulfil these functions serves, I think, to vindicate most uses of syllogistic reasoning by philosophers. For there seems no doubt that they generally use it, not as a means of attaining beliefs, but in order either to justify them or to demonstrate their implications.

In view of the foregoing discussion, whether I accept his views or not, I shall not condemn a philosopher out of hand because he postulates an entailment view of 'causation'; but shall treat his position as at least capable of significant discussion on its own merits. Nor shall I dismiss as inevitably vain, an argument's claim to express, and appeal to, an entailment in-

independent of linguistic convention; but here again I shall treat the claim as of a type capable of justification, and so shall discuss its justice on this assumption.

NOTES

1). Logical Syntax of Language (Kegan Paul 1937) Pt V.A. Sect.79 pp 305-6.

2) Principles Bk 11 Principle XXlV

3) Pp. 3-9

4) P.4

5) For a fuller account of the close connection of words and thought see A.J.Ayer: Thinking and Meaning.

6) The Foundations of Empirical Knowledge (Macmillan 1940) pp.87-9

7) See p.15

8) Even Wittgenstein, who alone is consistent in attempting to apply his analysis of language to his own use of it, still endeavours to assert something apart from linguistic rules by it, when he uses it to express this view. For though he admits that his view makes nonsense of all philosophy, including his own, he still supposes he can say so.

9) See p.15

10) See 'A Problem in the Relation between Use and Meaning': Analysis October 1949.

11) The Foundations of Empirical Knowledge pp.p6-7

12) See above pp.9-10

13) See p.10

14) On the Notion of Cause: Mysticism and Logic (Allen and Unwin 1932) p.180.

15) Logical Syntax of Language Pt.V. A Section 72. p.277

16) October 1950-October 1951

17) Experience and Prediction (University of Chicago Press 1938) Ch.1 'Meaning' Sections 6 & 7.

18) P.22

19) Cf. Chs. 6-8

20) Ch.7

21) This discussion must inevitably ignore many problems which a detailed treatment of the syllogism must consider: e.g. those concerning the relation between intensive and extensive definition, and the role of the copula.

22) I am inevitably concentrating here on this type of sentence for convenience; and am not intending to imply it to be the form to which all assertions are reducible - a question into which I clearly cannot enter here.

23) Pp. 32-5

24) P.15

25) P.62

26) Pp.62,5

CHAPTER 1.

AN EXAMINATION OF SOME COMMONSENSE USES OF THE TERM CAUSE.

(i) Introductory Remarks.

Since the commonsense uses of the term 'cause are inevitably the first to which the philosopher is introduced, and those which he adopts perforce in a large proportion of his speech and writing; it is to be expected that they will influence his professional use and discussion of the term to some extent. Furthermore most philosophers have supposed there was some affinity between their 'discussion of causation' and those sentences used by plain men which either contain the term 'cause' or are translatable into others that do. They have imagined themselves to be giving the correct analysis of such statements (or the key to it), or the true account of the situations to which they purport to refer. Some account of the commonsense usage therefore seems an indispensable preface to a discussion of that term as it has appeared in the discussions of philosophers.

I shall, accordingly, give as varied a selection of commonsense sentences containing the term as is possible; examining each singly with a view to diwcovering what 'cause' is intended to convey in each. This, if successful, will reveal whether to the use of the common term there corresponds some basic similarity between the assertions. If it is possible to discover some characteristic (qualitative or relational) which the plain man assumes to be present in each of a wide variety of instances to which he applies the term 'cause', it may be safely assumed that it is in virtue of this assumption that

he applies the term. For, if anyone applies the term 'cause' wherever he supposes a given characteristic or relation to subsist and nowhere else; he is, in effect, defining 'cause' in terms of that characteristic or relation.

In order to avoid the danger of prejudice or preconceived ideas leading me to proffer an unrepresentative set of examples I decided not to invent my own, instead selecting as varied a collection as I could discover in a number of newspapers. It is true that selection, no less than invention, may be prejudiced; I hope, however, that by reading at random through very varied material, looking not for situations or contexts of a specified type but only for a single word, I have reduced the danger of this to a minimum. Therefore, although I should not like to claim exhaustiveness for my selection, I venture to hope that it is sufficiently comprehensive not to be misleading.

Before I begin to discuss the commonsense uses of the term 'cause', however, a few explanatory remarks are required.

(a) The definition of 'commonsense conception'.

In the first place, it is necessary to note a possible source of confusion in discussing commonsense conceptions. Commonsense is generally opposed to philosphy as the unreflective to the reflective; and this, broadly speaking, is correct: in comparison with philosophy commonsense is unreflective. But it is important to remember that the unreflectiveness of commonsense is only relative. The foregoing discussion of 'meaning' should have made it clear that even such simple and common assertions as 'This is red', as ordinarily understood, involve comparison and memory judgments.

And I should say, from experience, that the plain man who never reflects (in an elementary way), apart from fulfilling these basic conditions of the application of language to actual objective situations, is very rare. Thus even were it possible (which seems unlikely) for a philosopher to give a wholly unreflective report of the given, he would not be proffering the commonsense view of it.

The definition of 'commonsense conception' is complicated by the plain man's acceptance of trust, of views attainable by those reflections only which abstract so far from immediate experience that they cannot be regarded as within the sphere of commonsense at all unless the distinction between commonsense on the one hand, and philosophy, theology, and science on the other, is sacrificed; a course which it would be hard to justify. Thus the universe of a plain man may contain angels, electrons, electric currents, and radio waves. Nor can such 'imported' notions be entirely eliminated from an account of commonsense views: the plain man's acceptance, and treatment, of them presumably bears some relation to, and is to some extent a reflection of, others of his conceptions. Sometimes, indeed, it is difficult to judge whether, or to what extent, conceptions are what one might call 'natural to commonsense' or moulded by the results of 'extra-commonsense reflection'. Is, for instance, the plain man's conception of himself as a voluntary agent entirely uninfluenced by the conclusions reached by philosophers and theologians?

In the following pages, therefore, I shall treat the term 'commonsense conception' as applicable to notions which seem to be,

or to have become, integral to the outlook of those who have made no specialised study of philosphy, science, or theology (which, of course, does not exclude their being integral to that of anyone who has made such a study), and which are therefore held by many without any specialised thinking.

(b) The commonsense conception of experience.

In order to understand the plain man's causal assertions it is necessary to understand the context in which he supposes them applicable: to do this is to understand his conception of experiance.

The plain man, like many philosophers and scientists, is convinced of the existence of an universe composed of continuants i.e. persistent entities which are not mere collocations of transitory sense data or events. And he holds these continuants to possess persistent qualities. He generally supposes these entities to be of at least two types: (a) physical objects all of which have some spatio-temporal position and characteristics and none of which can think and choose, and of such he supposes himself to speak when he makes assertions analogous to 'I see a chair', 'I climbed a mountain'; (b) entities possessing both the characteristics of mere physical objects and the ability to think and choose, and of these he supposes 'himself' to be one. (He often supposes the thinking choosing element in himself can exist independently of the physical, and postulates the existence of God and angels, thus supposing the possibility of a third type of entity - namely a thinking choosing being with no physical (i.e. spatial)

characteristics, and in regard to God may even be prepared to accept the denial of temporal characteristics. Whether any of these beliefs is, strictly speaking, natural to commonsense it is probably impossible to say now; though anthropology might be able to throw some light on the subject. Their acceptance by plain men, however, illustrates the readiness of the latter to postulate continuants which have persistent characteristics and which act.)

Everyone (philosophers and plain men alike) agrees that in ordinary conversational English 'I see a chair' is correctly asserted when a set of visual sense-data of a certain characteristic type are experienced while at the same time other sets of sense data, visual, auditory, tactual, and kinaesthetic, may reasonably be expected given specified conditions. The plain man, however, is further convinced that in sensing these data when he can truly say 'I see a chair', he is directly experiencing a continuant; and it is this continuant that he intends to apply the name 'chair'. Moreover, in the specific characters of the sense-data constituting such an experience he supposes himself to be experiencing qualities attributable to the continuant itself. It is generally assumed by philosophers that the attitude of the plain man is that which they entitle 'naive realism'. This conclusion is supported by his application of identical adjectives to sense data and physical objects; thus he asserts equally 'I see a red patch' and 'I see a red pillar box', while evidently intending in the latter sentence to attribute a quality to a persistent physical object. I have been forced to the conclusion, however, that this argues no more

than verbal incoherence, naive realism being completely inconsistent with commonsense practice.

It is the commonsense attitude to what philosophers have called 'tactual shape' which testifies most strongly to the commonsense rejection of naive realism. The basic importance attached to the sense of touch as providing evidence of the shapes of physical objects is unquestionable. The blind, and normal persons when in the dark or blindfold, unhesitantly ascribe shapes to objects on tactual evidence alone. Moreover, if the evidence of sight and touch conflict as to the shape of a given object, the plain man always prefers that of touch. If, for instance, one shows a child a stick standing in water, and hence appearing bent, and he suspects the illusion; he will perform the experiment of running his hand along the stick and on this evidence alone will confidently affirm it to be 'really straight'. One has but to analyse the experience of attributing shape in virtue of tactual and kinaesthetic sense data, however, to realise that it is never those date which is ascribed to the physical object whose shape they are regarded as evidencing, but only characteristics consistent with their being obtainable. That this is the plain man's opinion is confirmed by commonsense usage in which terms ascribing shape, e.g. 'round', 'square', etc., are applied neither to the totality of tactual and kinaesthetic data on the basis of which they are applied to physical objects, nor to individuals or subsets within the totality.

It might be objected that if this is so then the attribution

of shape must depend on inference and infants must be supposed capable of quite complex reasoning. But this is not so. If the thought of a baby drawing inferences is objectionable to anyone, there is no reason why he should not postulate, like Hume, an irrational human trait or instinct which consists in attributing a given shape to a persistent object when the appropriate evidence is presented.

Philosophers generally seem to suppose that plain men believe sensible colours to be persistent qualities of physical objects. This is certainly suggested by the commonsense practice, noted above, of applying the same adjective to sensible colour and physical object. The plain man's use of sentences such as 'The pillar box is red', is of course relatively unreflective; but I am not at all sure that, if pressed, he would insist that sensible colours persist unperceived. It is indeed difficult to conceive what any one can mean by this latter assertion.

If he does not suppose colours to persist unperdeived, then the plain man cannot be supposed to be identifying sense data with qualities of physical objects. For when he applies a colour adjective to a physical object he supposes himself saying something which is true independently of the conditions requisite for experiencing sense data. When, for instance, he says 'This table is brown' he does not intend this as a shorthand form of 'This table is brown so long, and only so long as some normally sighted person looks at it from certain positions is a good light'; but supposes himself to be ascribing to the table a quality which it possesses whether it is, or can be, perceived or not.

But even if it is maintained that when plain men assert 'This table is brown', they are postulating the persistence, unperceived, of sensible browness; naive realism cannot justly be ascribed to them. For they often make statements such as 'The table is really brown, but looks black', 'The curtains are really blue, but look purple';; statements which express a plain refusal to regard a seen colour as a persistent quality of the physical object they designate as its source or stimulus. If, therefore, one holds the plain man to suppose sensible colours persistent qualities of physical objects, one must admit him to recognise that he often sees colours which are not themselves qualities of physical objects; but which he nevertheless sees, under certain conditions alone, whenever he looks in the direction of a physical object.

There seem, therefore, to be only two accounts of physical objects' relations to sense data, which are consistent with commonsense practice. These are: (a) to apply a specified adjective correctly to a physical object is to assert truly that when it is correlated with a percipient in a certain manner, given conditions obtaining, he will have a specific type of sensory experience; (b) to apply a specific descriptive adjective to a physical object correctly is to ascribe to it justly a persistent quality in virtue of which a percipient, correlated with it in a certain manner under given conditions, will have a specific type of sensory experience. (The second of these accounts is, of course, consistent with the view that what is perceived thus may sometimes

be a quality of the object itself and sometimes a more or less distorted appearance of such a quality).

I think there is no doubt that the man in the street would prefer the latter of these alternatives since he seems to be sure that when he applies adjectives to physical objects he is ascribing characteristics to them.

The man in the street also applies adjectives to people, which he regards as describing them not as physical objects but insofar as they have minds. Thus he may call Jones honest, conscientious, unscrupulous, or selfish; and he may describe mankind in general as rational or free. In doing so, however, he does not always intend to ascribe to minds qualities which determine their correlations with other entities since he supposes that man, insofar as he possesses a mind (or mental characteristics), has freedom of choice. Thus when he describes anyone as 'honest' or 'unscrupulous', he intends to assert simply that he generally acts in a certain manner not that he must inevitably act in any specific way under given conditions. On the other hand, in applying some adjectives to minds he appears to ascribe to them persistent qualities determining, not indeed their correlations with other continuants, but their manner of acting or becoming correlated. Thus when he describes man as rational and free he appears to intend to ascribe to him persistent qualities in virtue of which he can reason, choose, and determine his actions accordingly.

The belief in an universe composed of continuants has not passed unquestioned by philosophers. Among modern thinkers, Berkeley first seriously questioned the belief in persistent physical objects in the ordinary sense, Hume going yet further in questioning the belief in a persistent mind. Since the belief has been questioned not only in the past but also in many contemporary analysis of perception, its truth cannot be taken for granted in any serious discussion. Something must therefore be said about it before discussing commonsense 'causal assertions', since the plain man normally intends any assertion about experience to refer to continuants either directly or indirectly. But here, once more, is a problem which has been discussed so often and in such detail that I cannot hope to deal with it adequately in the space I can reasonably devote to it in this thesis. I shall therefore merely summarise the main points relevant to its discussion, noting some of their implications.

(1) There is no intrinsic objection to the commonsense view; for there is no inherent impossibility in the existence of a continuant exhibiting persistent characterisitcs, and affecting, or being affected by, another (this latter will be made more explicit and further justified in what follows) whether in stimulating perceptions or having them stimulated or no. It is certainly contradictory to suppose anything to persist and alter in the same respect, but as Johnson's analysis (1) reveals, this contradiction is not implicit in an account of change in terms of continuants.

(2) The commonsense view as I have outlined it, is perfectly consistent with the evidence of experience. This is not true of naive realism which philosophers usually seem to attribute to commonsense; but as I have already argued, this is not the view of the plain man.

(3) On the other hand, however, it is maintained that the evidence of experience is equally consistent with the phenomenalist account of it in terms of categorical and hypothetical assertions about particular experiences alone; if this is so it may well be objected that the postulation of continuants is unwarrantable since not only can experience be accounted for without this but it can be accounted for solely in terms of what it is capable of presenting directly. For even though one admit, with Price (2) that an account of experience in terms of phenomenalism, no less than one in terms of continuants, must postulate inverifiable hypotheses; one cannot justly deny that phenomenalism has the advantage in that none of the assertions implied by its hypotheses is intrinsically unverifiable within the limits of human experience; since the impossibility of verifying such an hyothesis as it supposes asserted by sentences analogous to 'This is a chair', 'lions are carnivorous', 'he is dishonest'; lies in their truth implying that of an infinite number of assertions (in addition to the existence among these of subsets whose members are not humanly verifiable in any case).

(4). Further, as Professor Ayer has pointed out (3) one cannot defend an account of experience in terms of continuants by recourse to the traditional argument that sense data must have some cause and only continuants will fill the bill, unless one can justify the assertion that sense data must have some cause - a contention which would have to face many objections today.

(5) A phenomenalist account of experience, if it is to be consistent, is inevitably very complex. For commonsense the sentence 'This is a chair' asserts the existence, in a given spatio-temporal position of a something of a fairly easily specifiable character, a something whose behaviour in a variety of circumstances is readily enumerated; and it implies an infinity of other assertions about possible experiences, e.g. that if any person with normal sight stood in a certain position, there being present a given degree of illumination, he would see a brown patch of a specified shape. But for the phenomenalist not only can it be regarded as asserting only these hypotheses, but the hypotheses themselves become much more complex since they must be interpreted solely in terms of hypothetical assertions about sense data. That is to say he must regard 'This is a chair' as asserting simply an infinity of hypotheses such as the following: if a discontinuous sense data series occurs wuch that in ordinary language it would be described as 'the experience of one person' and this series has contained visual sense data up to the present, then if in that series there occur sense data which would in ordinary language be described in given circumstances as 'the experience of walking down

the hall outside opening and coming through that door into this room and looking in a certain direction', and neither the series as a whole nor the occurrence of visual data within it ceased immediately (either temporarily or permanently); then a sense-datum of a given type - namely a brown patch of a given shape - would occur. The foregoing is indeed an abbreviation; since to the consistent phenomenalist that which makes a sense data series 'one person's experience' and 'the experience of walking down a certain hall and through a given door' are also to be conceived solely in terms of the truth of hypothetical assertions about sense data. If therefore one is of Copernicus' opinion that the simpler of two hypotheses is to be preferred, one will be forced to accept an account of experience in terms of continuants.

(6) It is, indeed, impossible to formulate a precise phenomenalist account of either experience in general or of any particular experience usually described in terms of physical objects. For, as H.H.Price and Professor Ayer have made clear (4) no physical object sentence is translatable by a finite set of assertions about sense data. This is sufficient to condemn phenomenalism in the eyes of some; but I do not think it can justly be so regarded. As professor Ayer has pointed out (5) it does not make it any the less true that 'to say something about a material thing is always to say something about sense-data', it means only 'that one's references to material things are vague in their application to phenomena and that the series of sense-data that they may be understood to specify are composed of infinite sets of terms'. Thus ~~And since~~ if the objection is to have any force the

the objector must be able to understand what is meant by an infinite series although he can never experience one. But if it is possible to understand what is meant by infinity, then it is possible to conceive what would be involved in the truth of an hypothesis implying that of an infinite number of assertions of a given type. The postulation of such an hypothesis would thus be justifiable were there sufficient grounds for accepting it.

(7) Although the phenomenalist postulates nothing of a type intrinsically incapable of direct verification, he yet makes very large assumptions. For he accepts generalisations of both science and commonsense such as that arsenic poisons, fire burns, wood may be chopped and burnt, etc. And in doing so he is not making simple generalisations about every existent of a given type under certain readily verifiable conditions e.g. that whenever a pink triangular sense datum occurs simultaneously with one describable as the sound middle C, it is succeeded by a blue circular sense datum - or more complex laws of the same type. Instead he is assuming a multitude of laws each affirming that if an infinite number of hypothetical assertions about sense data are true, then sense data of given types will occur under certain conditions (also specified by the truth of innumerable hypothetical statements about sense data). Thus in holding that arsenic causes death, he assumes that whenever sense data occur, which are such that he would describe them as a person's taking arsenic none occurring such that he would describe them as his taking an emetic, others describable as observing a corpse in a given state would occur

'in another's experience' under given circumstances; a person's taking arsenic or an ematic or observing a corpse in a given state, each consisting in the truth of innumerable hypothetical assertions concerning sense data as well as that of one or more categorical statements about them.

Since the phenomenalist ordinarily denies any intrinsic connection between sense data, and has no ground for supposing any, he has no prima facie reason for postulating such laws. And since moreover each postulates the truth of an infinite number of assertions, he can never hope to obtain evidence in itself adequate to justify the attribution of any significant degree of probability to them. I think a phenomenalist justified in arguing that it is reasonable to accept hypotheses consistent with the evidence available, even though this is always inevitably inadequate to confer a significant degree of probability on them, for the only other alternative is to postulate an hypothesis inconsistent with the evidence (since to refuse to formulate an hypothesis is in effect to say that any may be true - which is itself an hypothesis). He would then be in a position, given that his hypothesis <u>is</u> consistent with the evidence, to prefer his account of experience to any in terms of continuants on the ground that the latter does, while the former does not, postulate something intrinsically unverifiable by us. But he is certainly not justified in ascribing certainty, or even a high degree of probability to his conclusions. He can merely claim to postulate what any reasonable person must, though admitting it might well

prove false.

(8) Many philosophers, of whom Price (6) is a notable example, have argued that in 'experiencing physical objects' we are directly aware, not merely of actual sense data and the expectation that others of specific types are obtainable under given conditions, but of spatio-temporal existents which persist and possess 'causal characteristics'. I have no doubt that plain men would agree with them; it is certainly what anyone supposes himself aware of in 'perceiving physical objects' before he starts analysing the experience philosophically. (And, of course, he may, like Price, continue to suppose so after such analysis). It is possible, however, that such awareness might be illusory; both plain men and philosophers are indeed prepared to admit that a person may be mistaken when, on a given occasion, he supposes himself aware of a continuant.

(9) Price goes further than this, arguing that the very notion of 'anything having causal characteristics', which is integral to any adequate account of experience, presupposes the ecistence of a continuant as subject of these characteristics.(7) His argument, however, seems clearly circular since it assumes that the phenomena ordinarily described as 'things having causal characteristics' can be accounted for solely in terms of continuants and their characters, which is precisely the point the phenomenalist would dispute. For the latter supposes the ascription of 'causal characteristics' like any other assertion concerning 'physical objects', acceptable only insofar as it postulates hypothetical

(and, when one is properly attributing 'causal characteristics to 'this', categorical) assertions about sense data. That it postulates so much is indubitable; that it could or should postulate no more certainly cannot be disproved by mere denial.

(10) If phenomenalism is true, many wishes and emotions, ordinarily thought readily comprehensible, are inexplicable. Why, for instance, should experiences ordinarily described as 'wishes for her son's welfare and concern for his safety' occur in the sense data series ordinarily called 'Mrs Brown's experience', if 'the welfare and safety of her son' consist in no more than the truth of certain hypothetical assertions about sense data. The phenomenalist could consistently maintain that on his interpretation there is no reason why these experiences or any other should be supposed explicable. And he could further point out that since on his theory 'Mrs Brown's experience' is simply a series of essentially distinct sense data the interpretation of any part of it as dictated by motive in the everyday sense of the terms is clearly out of place and unwarranted. Furthermore one is not entitled to assert that this type of experience must be explicable, unless one can justify that assertion in the face of possible sources of objection such as arguments against universal causality.

It is undeniable, however, that to most people a phenomenalist account of such experiences is blatantly inconsistent with their observed character. This belief could conceivably be mistaken; but it is clearly incumbent on any phenomenalist to show that this is so.

(11) There is one element in experience which seems to me indisputably incompatible with phenomenalism, namely the awareness of experience as successive. It seems palpably false to describe the experience we call 'hearing a piece of music' simply as a succession of auditory sense data; it seems indubitably an awareness of one sound as following another. But an awareness of sense data as succeeding one another in time presupposes the existence of something coexistent with each of them, and hence persisting through time; which is capable of perceiving, remembering, and correlating the perceived with the remembered. It seems to me therefore that even though 'physical objects' could be shown to be conceivable in terms of the truth of hypothetical assertions concerning sense data, experience is such as to demand the postulation of continuants analogous to 'minds' or 'percipients' as ordinarily conceived (or at the least, one such).

(12) It also seems impossible to conceive distinguishing a sense data series as 'one person's experience' in terms of phenomenalism. Certainly it would be theoretically possible to enumerate the sense data which went to make up my experience. But memory - the recall of past awareness of sense data-seems to play an integral role in my acknowledging sense data to have formed part of my experience. For even though I sometimes accept the assertion that it contained given sense data on other grounds than that of direct memory of awareness of these sense data, memories form part of the total evidence without which I should not accept that assertion. Moreover such an assertion seems to be understood.

partly at least, by reference to the experience of memory; for I suppose that if it is true that I experienced a given sense datum under certain conditions, I might have remembered it, that I probably did remember it at some time in the past, and might possibly do so again in the future.

(13) The foregoing should have made it clear that while some 'causal assertions' assume the existence of continuants, some traditional defences of the postulation of continuants rest on 'causal assertions'. Nevertheless 'physical object' and 'causal' assertions are not all so inextricably linked that it is possible to formulate no argument which is not circular, about either 'causes' or 'physical objects'. Thus, for instance, it is possible to discuss whether it is reasonable to assume the validity of laws involving the truth of an infinite number of hypothetical assertions about sense data, without assuming the existence of continuants. Similarly it is not necessary to make that assumption in order to discuss whether every occurrence of a sense datum must be preceded by that of another or whether it must always stand in a given relation either to another sense datum or to something else: And, it has been seen that one may similarly argue for or against phenomenalism without appealing to causal assertions.

(ii) Some uses of the term 'cause' in everyday speech.

The term 'cause' is very common in everyday speech. Indeed do we ever converse long without using it? The morning papers and the radio news bulletins contain accounts of a serious rail accident, and this not unnaturally provides a topic of general conversation: what is the tenor of such conversation but a discussion of the 'causes' of the accident? Similarly if talk turns to an economic or political crisis, it resolves itself largely into a discussion of 'causes' and 'effects'. A friend looks ill or visibly distressed, what is my concern but for the 'cause' of his trouble? he meets with an accident or financial loss, and my question is the same. A neighbour travels to Scotland, a statesman travels to Washington or Moscow; and immediately there are questions, speculations, and assertions about the 'cause' of this move. My cabbages or carnations are blighted, or a cake fails to turn out as it should: and again I demand the 'cause'.

Newspapers provide numerous and varied examples of the commonsense use of 'cause'; and it is from them that I have taken the selection of sentences containing the word which I am examining in detail. The majority of my examples are headlines, but three are sentences occurring in the body of articles. In each instance the context made the meaning clear, the sense in which the headlines were intended being made explicit in the accompanying paragraphs they were intended to summarise.

The following are the examples I have chosen: 'Cigarette end may have caused market blaze', 'Small insect causes big trouble', 'Safety lecture causes accident', 'Devaluation of the pound causes trouble in shipyards', 'Rain causes many craches', 'Professor Manley told me afterwards that the cause of the increased temperature might lie in some type of variation in the atmosphere or the behaviour of ocean water', 'The high temperature caused the lines to expand with the result that they twisted out of shape thus derailing the express', 'Brumas causes traffic enquiry', 'Cause of nurses death unknown', 'Lack of boys' clubs is one cause of juvenile delinquency', 'It is a profound truth that someone to love and someone to love him is a vitamin without which no individual can develop aright. And there (in its absence) you have the chief cause of juvenile delinquency'.

It will be noticed that the term 'cause' is here used both as noun and verb. I think experience sufficiently testifies that when the plain man asserts 'A causes (caused, is causing, or will cause) B', he intends to assert that it has (had, is having, or will have) a relation to B in virtue of which it can be correctly described as 'cause' of B'. In the following discussion I shall adopt this usage, employing the term as noun or verb as seems convenient.

One cannot read the above selection of sentences without being immediately struck by one important difference between most of them and the sentences which modern philosophers ordinarily consider when discussing 'causation'. When a philosopher 'discusses causation' today he normally examines only general assertions such

as 'Arsenic causes death', 'Mosquitos cause malaria', 'Bacteria cause putrefaction'. (8) All but two of my examples, however, do not assert generalisations but merely offer explanations of particular events. 'Cigarette end may have caused market blaze' for instance, is not asserting a generalisation about fires and cigarette ends (though as will be seen below when the plain man thinks it justified he assumes the truth of such generalisations), but postulating a probable explanation of a particular fire all the circumstances of which are not repeated (nor expected to be) whenever lighted cigarette ends fall or fires occur. This difference of emphasis between plain men and philosophers is readily understandable. The plain man is naturally interested primarily in this fire or that car crash, generalisations being important to him only insofar as they help to throw light on these particulars. For his life is made up of particular events and he is concerned only to learn to understand and deal with them as they arise. The philosopher, on the other hand is concerned with the assumptions underlying assertions both of plain men and philospphers; he is forced to recognise that little can be said about particulars without appeal to generalisations and therefore rightly regards examination of the latter as of paramount importance. (9)

The fore-going selection of examples is also notable in its variety. The term 'cause' is applied indifferently to continuant, event, a group of specifically similar continuants, groups of specifically different events which the plain man regards as constituting states of a continuant and an environment respectively,

an unknown X, and the absence of some condition. Further, even when the 'causes' postulated fall within the same category their relations to their 'effects' are not regarded by plain men as completely analogous. To commonsense the headline proclaiming 'Brumas causes traffic enquiry' is assigning him a very different role from that attributed to ~~tsetse~~ tsetse fly by the headline 'Small insect causes big trouble'.

There is more uniformity among the 'effects', however, all but one of which would be regarded by commonsense merely as the occurrence of an event or a group of events. One of them, namely the generally warmer climate which the professor was attributing to Britain and postulating as an effect, would be regarded by the plain man rather as a general state of a continuant (or at least its having given states during certain periods of time).

None of the 'effects' postulated in the examples would be regarded as a continuant by commonsense. I think this reflects not a refusal in plain men to regard continuants as 'caused', but merely the fact that the 'effects' which it is most often useful for him to consider are events. If, for instance, the plain man develops a boil he may well ask his doctor its 'cause', in so doing wanting an explanation not merely of an event, or number of events, but of what he regards as the continued existence through time of something having spatial dimensions. Similarly a town dweller who has newly acquired a garden may ask the 'cause' of the small mounds which he suddenly finds disfiguring his lawn; intending in so doing to

demand an explanation of the existence of spatiotemporal continuants. Again a hospital, school, or concert hall is often referred to as the result of a person's action, just as a fire is sometimes described as the result of a cigarette end's being dropped. But the plain man's descriptions of continuants as 'caused' do not normally involve any conceptions different from those involved in his describing events as 'caused'. For commonsense supposes the coming into existence of a continuant normally consists in a series of events ending at the moment when the continuant can first properly be said to exist. And, moreover, it supposes the latter's persistence through time to be dependent on conditions analogous to those on which it supposes the occurence of an event series to depend.

(a) The Commonsense View of Causal Event Sequence.

In four of the examples cited above the term 'cause' is applied to a continuant or group of continuants: namely, to an inanimate object, a number of insects, a man, and an animal. Nor can there be any doubt that in three of these the title is so bestowed in virtue of an event or events attributed to the history of the continuant (or continuants) concerned. A cigarette end which had been properly stubbed out or which though dropped alight, had fallen into a puddle where it was extinguished or on to a paving stone where it burned itself out harmlessly, would not be called the 'cause' of the fire. Nor would the 'small insect' (tsetse fly) have been called 'cause' of the big trouble' (dislocation of

cattle farming in parts of Africa) had it never had contact direct or indirect with cattle. Similarly the safety lecturer would not have been called 'cause' of the accident had he not acted in a certain way.

It appears from the accompanying paragraph that in postulating a cigarette end as 'cause' of the fire the writer intended to assert that he supposed the blaze to be the culmination of a series of events of which the first was the dropping of the lighted cigarette end on straw or shavings, and the intermediaries a continuous series of ever increasing ignitions. Similarly tsetse fly are called 'cause' of the 'big trouble' which is the dislocation of cattle farming, because their biting cattle is regarded as the origin of a continuous series consisting in physical changes in the animals bitten and subsequent decisions and activities on the part of their owners, which are describable as a dislocation both of their lives and of the district's agriculture. The man is likewise called 'cause' of the accident because something he did while driving a car is thought the initiator of a series, consisting in events ascribable to the car's history, culminating in the collision.

In order therefore to understand and evaluate assertions analogous to those expressed by these three headlines, it is necessary to discover how the plain man requires an event series to link continuant and event before he is prepared to call the former 'cause' of the latter.

His selectiveness makes it clear that he does not regard the relations linking initiating and culminating event as purely temporal. Did he do so he would have no reason for designating the dropping of a cigarette end rather than the simultaneous striking of the town hall clock as originating the series leading to the fire. Nor would he have any grounds for supposing the connecting link between the fire and its 'cause' to consist in the series constituted by the dropping of a lighted cigarette end, and the subsequent successive ignitions of straws a,b,c etc., stalls x,y,z., rather than that composed of the striking of the town hall clock, the barking of a dog in the next street, the hoot of a motor horn, the whistle of a distant train, the launching of a ship fifty miles away, an earthquake five thousand miles away, and a child crying out in his sleep. And he shows further selectiveness in regarding the cigarette's fall and no earlier event in the history of cigarette, the person dropping it, or any other continuant, as initiating the series linking the fire to a continuant as its 'cause'.

What then besides temporal succession does the plain man require of an event series before he consents to regard it as the connecting link between continuant and event entitling him to call the former 'cause' of the latter? and what leads him to specify one particular event as initiating such a connecting series?

Consideration of the series regarded as connecting the fire with the cigarette end might well suggest that plain men regard

spatial continuity as a condition of causal sequence since the cigarette end is regarded as igniting only that with which it is in contact and so is each continuant held to be ignited in the process. And, indeed a similar spatial continuity is postulated in all physical causal sequence. But an examination of the interpretation which commonsense gives to the assertion that tsetse fly 'cause' farmers to act in a certain way reveals the plain man ready to postulate as 'causal' an event sequence to which he does not attribute spatial continuity. For when he calls tsetse fly the 'cause' of Brown's abandoning farming, or ceasing to farm a particular area, he means to postulate an event series connecting the actions of the insects with those of Brown; some of the events regarded as indispensable to this being thoughts and decisions occurring in Brown's history, which latter events the plain man does not regard as having any spacial characteristics at all. He would, for instance, think it nonsensical to describe Brown's decision as being, or appearing to be, to the right or left of either another thought or decision or a physical phenomenon. Nor does he suppose assertions about Brown's thoughts and decisions merely a way of describing spatially related phenomena in Brown's brain.

Nor can the required link consist in, or rest on, the attribution of each event in the connecting series to the same continuant. In none of the examples under discussion are all the events in the connecting series, including its originator and culmination, attributed to the same continuant. The events

thought to link cigarette end and fire are attributed variously to cigarette end, straw or shavings, a succession of stalls, and finally the market as a whole; those linking 'small insect' with 'big trouble', to insects, cattle farmers, their families and property; those linking safety lecturer and accident, to the lecturer, and his car (the culminating event being attributable to them both as well as to the other car and its occupants, or if the term event be confined to relatively simple occurrences the series may be said to end in a complex of events attributable respectively to each car and each of their occupants). Moreover, the plain man does not always regard an event series attributable to one continuant as 'causal'. If, for instance, a plain man first smells the scent of a rose, immediately afterwards hearing a bird sing then successively coughing, hearing the sound of a lawn mower, seeing a cat walk across the lawn; he does not suppose this series to form either the whole or a part of one linking him with an event as its 'cause'. Nor, on the other hand would he refuse to regard an event series as 'causal' because its members were all attributable to one continuant. He might for instance assert that Smith 'caused' his own death by drinking poison, thus intending to assert him to be 'cause' of the final event in his history as a living man in virtue of an earlier event in his own history linked with the final one by intermediate events all of which also occur in that history. In the language of philosophers, the plain man supposes a causal

sequence may be either transeunt or immanent.

To most modern philosophers a 'causal' sequence of events is one of a type which may reasonably be supposed to have occurred in the past whenever certain conditions have obtained, and whose recurrence in the future whenever they obtain, it is (in the present state of our knowledge) more reasonable than not to expect. And for some it is a sequence of a type which inevitably occurs under given conditions.

The plain man would agree that the sequence of events connecting a cigarette end with a fire as its 'cause', is of a type which may reasonably be expected to occur under given conditions. And I think he would go so far as to suppose that if a lighted cigarette end is dropped under the requisite circumstances, a fire will inevitably follow. Certainly if anyone suggests that a fire might not follow even though the cigarette end's fall and all the other conditions were fulfilled, his normal reaction is to say not that this is very unlikely, but that it is impossible.

As the above paragraph indicates, the plain man does not suppose the cigarette end's fall must have been followed by the fire unconditionally. It has been seen that he supposes a cigarette end's fall would not have initiated the series culminating in the fire had it not both been alight and fallen on dry straw, shavings, or what he regards as similarly inflammable material. And his keeping firefighting equipment where there is what he regards as inflammable material, testifies

that he further supposes such a series, once started, may yet be intercepted. Moreover he acknowledges that the series may fail to follow the cigarette end's fall owing to a persistent condition: he may for instance say the straw was too damp to ignite; and he is prepared to accept the scientist's word that if oxygen had not been, and remained, present the series could not have occurred. But he supposes both all occurrences of, and all deviations from, the series which follow the fall of lighted cigarette ends, matches etc., to be consistent with laws of regular correlation exemplified throughout the universe's temporal and spatial extent. He supposes, for example, that the complete series never fails to follow the initiating event unless conditions of given types obtain (these conditions may of course consist in either the presence or absence of something; e.g., he supposes either the presence of dampness or the absence of oxygen may prevent the series following the cigarette end's fall); and that whenever one of these conditions obtain the sequence either fails to occur at all or is not completed. He even supposes that there is a precise correlation between different deviations from the series and conditions of given types: e.g. that the application of a small quantity of water or sand intercepts the series at an early stage whereas at a later point only the application of a much greater quantity does so.

The plain man, however, does not ascribe a like necessity to every event series he regards capable of relating continuant

and event as 'cause' and 'effect'. That which he regards as linking thus tsetse fly and the dislocation of farming is one of which he would most probably deny it. He certainly supposes a series of changes in an animal culminating in its death inevitably follows its being bitten by a tsetse fly (certain conditions obtaining). And he further holds that if a farmer makes a given decision (if for instance he decides to move) and specific conditions hold, then events of a certain type will occur. But he also believes that, in the whole series linking tsetse fly with a farmer's actions there is at least one event of which it is false to say that it is of a type which always must occur under given conditions. For he supposes a decision is essentially an event which either may or may not occur under certain conditions. He does, indeed, suppose the indeterminateness of a decision to have limits; for he does not suppose anyone can decide to do what he supposes completely impossible. It is therefore possible that in saying tsetse fly had 'caused' a dislocation of farming the plain man might intend to assert that their ravages had rendered cattle farming completely impossible in the district and so created conditions in which farmers there inevitably decided on some course of action involving giving up cattle farming in that area, although the precise nature of that decision was not inevitable. If the plain man intends to assert this in calling tsetse fly 'cause' of a dislocation of farming, then he regards the occurrence of the first term in the connecting series as rendering that of the last inevitable; since although he does not

suppose the precise nature of the decision inevitable, he does suppose this to be true of that element in it which renders the culmination of the series so. Nevertheless he still does not regard the series as wholly analogous to that linking cigarette end and fire since he supposes the character of each member of the latter to be determined completely by the conditions relevant to it. But the plain man may well not wish to attribute even so much necessity to the series linking insect and dislocation of farming. For he generally supposes there is a fairly wide variation of degrees of risk or difficulty within which a person may or may not decide on a certain action. He holds, for instance, that under certain circumstances a farmer could decide either to give up farming in a certain area or try to combat the ravages of insects decimating his stock. In calling tsetse fly cause of the dislocation of a district's agriculture he might therefore mean to assert that in a situation created by these insects, either of these decisions was possible; but that most farmers had made the former. The content of the article headed by the assertion in question indicated that this was indeed the interpretation put on it in the present instance. If this were so it was postulating an event series linking continuant and event as 'cause' and 'effect', at least one member of which was thought not to be inevitable.

Furthermore, even when the plain man thinks it very unlikely that Brown will decide on a given course of action under certain conditions, he will not admit it to be reasonable to expect his

not doing so, with anything approaching the degree of confidence placed in the implementation of causal laws by those who suppose this but highly probable. And I think it true that a philosopher so regarding 'causal laws', would be far more astonished at finding arsenic failing to cause death under the usual conditions than would the plain man if he heard that Brown (who otherwise seemed sane enough) had decided to try to continue farming as before even though financial ruin seemed certain for him if he did so.

The plain man's specification of an event series as linking a continuant and event as 'cause' and 'effect' cannot therefore be regarded as resting on the assumption of either its necessity or the probable invariability of the occurrence of like series under like circumstances. On what then can it rest?

Is there anything the plain man holds to be true of all the continuant 'causes' discussed above? I think there is. His reactions to situations analogous to those describable in terms of the headlines in question reveal that he supposes each of the 'causes' indispensable to the occurrence of the 'effect' ascribed to it. When, for instance, a plain man supposes a fire to have been caused by the fall of a cigarette end, he often condemns the person who dropped it with remarks like: 'Thanks to the fool who carelessly dropped his cigarette end we now have no market' - a most unreasonable charge unless he believes the fire would not have occurred had the cigarette end not been dropped. Similarly when he supposes a certain type of insect to be 'cause' of cattle

plague, he does his best to see that such insects are destroyed and prevented from breeding believing that by so doing he will prevent an outbreak of the plague. And his hopes are clearly vain if he supposes the sickness might occur independently of those insects. Again, if Jones is thought the 'cause' of an accident, he may be taken to court and fined or have his licence endorsed, a most unjust proceeding unless it is held that the accident would not have occurred had it not been for him. And plain men exhibit many reactions to the belief that Jones 'caused' the accident which reveal the same opinion. They may make remarks like 'Brown would still have been alive if it hadn't been for Jones'; they may feel Brown's widow is justified in feeling resentment against Jones; Jones himself may want to offer her some compensation.

When the plain man calls an A 'cause' of a B he does not mean to assert unconditionally that no B can occur independently of an A, nor even to affirm unconditionally that no B could have occurred then and there independently of A. When Jones calls a cigarette end the 'cause' of the blaze in the market last Tuesday, he is not intending to assert that no fire occurs unless a lighted cigarette end falls on dry straw or shavings. He has no doubt that the market might have blazed then had an incendiary bomb been dropped or an electric current shortcircuited in the vicinity. In calling a cigarette end 'cause' of last Tuesday's fire he intends to deny there was then the explosion of an incendiary bomb or short

circuiting of an electric current in the vicinity; nor anything else, besides the cigarette's fall, which together with the other conditions obtaining at the time would have made a subsequent blaze possible. I do not think this necessarily commits the plain man to belief in the plurality of 'causes', however. His distinctions are not sufficiently precise to provide him with adequate grounds for either accepting or rejecting this view. Nor do I see any reason why, were it suggested to him, he should reject the possibility that, were both analysed with sufficient precision, 'effects' of one given type would always be found due to the same type of 'cause'. That he would not be averse to this suggestion is indicated by his ready recognition that death from arsencial poisoning is very different from death from heart disease, and this again from death due to a bullet through the brain. The procedure of the coroner's court is clearly based on the assumption that if the character of an 'effect' is specified with sufficient precision that of its 'cause' may be inferred equally precisely. And L.S.Stebbing's view of the attitude of the coroner's cour as 'a refinement of the commonsense notion of cause' which 'would be quite useless to commonsense' (10) seems to me wholly unjustified by the facts. Did Miss Stebbing really suppose the plain man indifferent to the distinction between death from arsenical poisoning and death from a heart attack? and did she suppose there are no plain men among the avid readers of detective stories who think the state of a victim's corpse a clue to the manner of his death and hence to the identity of this murderer?

Those to whom a 'cause' is an event inevitably followed (under certain conditions) by another of a given type, or to whom it is simply one of a type always in fact so followed, normally suppose these 'causes' indispensable to their 'effects' under specific conditions. Clearly, however, neither view of the 'cause's' role demands or justifies belief in its indispensability to its 'effect'. An universe or pattern is conceivable in which every A is followed by a B, though a B sometimes occurs not only without being preceded by an A but without being preceded by anything of which it can be said that such an one is invariably followed by a B or that no B occurs unless preceded either by such an one or something of one or another given types. Thus though a fire was inevitable in certain circumstances given the fall of a cigarette end, unless a fire never occurred unless preceded by an event which is of one or another of a given set of types, there would be no justification in asserting the fire's dependence on the cigarette end. For there would then be no reason to suppose the fire would not have occurred anyway whatever had preceded.

If a 'cause' is indispensable to its 'effect' the latter must either be such as to be intrinsically incapable of occurring under given conditions without the former, or else of a type in fact never exemplified in the absence of anything similar in type to the 'cause'. That is to say, to regard a 'cause' as indispensable to its 'effect' is to suppose it a necessary condition of the latter either intrinsically or in virtue of the general order of the universe of experience of which it forms a part. Thus even

although the plain man does not ascribe inevitability to all events he supposes 'caused' by a continuant in virtue of a connecting event series, the notion of necessity is intrinsic to his conception of 'causation'.

I think the plain man holds not only that no such event will occur in the absence of an event series of either one specific type, or of one of a given set of specific types, linking it with a continuant; but that it is intrinsically incapable of so doing. For he does not appear to entertain the possibility of an universe so ordered that fires, sicknesses, accidents etc., occurred in the absence of any of their accustomed antecedents under the conditions given which these antecedents are generally regarded indispensable to this. The existence of fairy story and fantasy testify that he does not suppose their occurring in the absence of their accustomed antecedents inconceivable., But the character of these fantasies also testifies that he never imagines this happening in a situation completely analogous to those in which he supposes it will not happen in fact. Thus he is prepared to imagine a Wonderland in which Alice grows larger or smaller with no regard to experienced uniformities; but it is a Wonderland in which there are found food and drink peculiar to itself, the eating or drinking of which is regularly followed by drastic changes in size. And similarly in the fairy story the giant's castle may burn down without the aid of cigarette end, incendiary bomb, etc., but it would not have done so had it not been for the words or actions of a being of a sort the plain man does not expect to meet in the everyday world.

The philosopher who concurs with Hume's denial that we ever observe intrinsic connections between events, may ask in what could the plain man suppose the intrinsic dependence of 'effect' on 'cause' to consist since he can never observe it. Whether or no any such dependence is observable, however, a situation capable of verifying an assertion of the type 'A is such that it cannot exist in the absence of B (or of B's having stood in a certain relation to it) is readily conceivable. To the plain man, as has been seen, a decision is a free choice of a course of action which for some reason or other seems desirable. Clearly such a choice is of its nature incapable of occurring unless: (a) something exists capable both of recognising a course of action as desirable and of either choosing it or not; and (b) a course of action capable of appearing desirable to the former is possible. It might be objected that I am here not describing a possible intrinsic dependence, but merely formulating a tautology since 'A is a free choice' and 'A is the choice of a desirable course of action by one who could make it or not' are treated as synonymous. But A's freely choosing what appears to him desirable is identical with neither the possibility of his choosing it or not, the possibility of its appearing desirable to him, nor the combination of both. Similarly A's throwing a snowball when his throwing it or not was possible, is not identical with the possibility of his throwing it or not. And it seems to me that in recognising that a complex situation cannot occur in the absence of one of its elements, one is not simply observing that it is what it is but

rather acknowledging what is essential to its being what it is. This may perhaps be made clearer by the following examples. If the commonsense account of the phenomenon of drinking should be correct, and it consist in a continuant's consumption of a non-solid something capable of persisting and exhibiting spatial characteristics; then clearly drinking would be intrinsically impossible in the absence of any such persistent non-solid something. Or again, if playing billiards or marbles consists in moving small solid continuants about, the playing of these games is intrinsically impossible in the absence of such continuants.

Clearly his belief in its indispensability to its 'effect' is not the plain man's sole criterion for calling cigarette end or tsetse fly 'cause' of fire or dislocation of cattle farming respectively. For not only does he suppose each event in the series linking these 'causes' with their 'effects' equally indispensable to the occurrence of the latter; but, as has been seen, he supposes many other factors (e.g. presence of oxygen and absence of the application of water or sand in the case of the fire) equally so. To answer the question why the plain man singles out as its 'cause' one continuant among the many factors he thinks indispensable to any event's occurrence is, among other things, to answer the second of the questions posed earlier; namely what leads him to his specification of an event as initiating the series. For he supposes events prior to the cigarette's fall and the insects' bites indispensable to fire and dislocation of farming respectively. He supposes the fire would not have occurred last Tuesday if Brown

had not dropped a cigarette end there and then; and he supposes Brown would not have been there then to drop it if a series of events attributable to his heart, lungs, blood etc., had not occurred, nor another series constituting his conception and development between conception and birth, nor yet others attributable to his parents' histories and to those of their parents and so on. And similarly with the event series he regards indispensable to the dislocation of farming or the accident, of which he calls tsetse fly and safety lecturer 'cause' respectively.

The most noticeable feature of the point to which the 'cause' series' is traced in all these examples, is its practical utility in the eyes of commonsense. Thus even though the progress of cattle plague, once introduced into the organism, could be halted at any point so that the beast so cured recovered completely; to know this would clearly be far less useful than knowing a given insect's bite indispensable to its inception. For if one knew only how to halt the process once begun, it might well recur again and again thus rendering cattle farming either impossible or very difficult. On the other hand the knowledge that no beast would begin to develop the disease unless bitten by a tsetse fly, would reveal that the disease could be completely eliminated by the destruction of that type of insect and the prevention of its breeding. Similarly, to know that a progressive series of ignitions will not occur under given conditions unless a lighted cigarette, match etc., is dropped on dry straw or shavings, is clearly much more useful than the

knowledge how to intercept such a series once started. If only the latter were known, a great deal of time would probably be wasted in firefighting which need not have been so spent had the type of event in the absence of which such series would not have started, also been known. In the third example the principle of utility is even more evident, since the plain man supposes the careless driving is often the latest member of a series culminating in an accident which could have been avoided. And even when this is not supposed, it is clearly much more satisfactory for every one if accidents are avoided by careful driving on the part of all concerned rather than by very skilful driving, or extreme agility, on the part of one of these. Moreover, not only does the plain man regard the initiating event as a more useful point to which to trace the 'causal series' than is any of its successors; he also supposes that it is only in virtue of knowledge of its role that knowing that of earlier indispensable conditions of the 'effect' proves useful. Thus for instance he supposes it useful to trace the series culminating in the dislocation of cattle farming, back through the events composing the life cycle of tsetse fly, only because he supposes that the knowledge will enable him to destroy such insects or stop them breeding, thus preventing cattle suffering the fatal bites. Similarly he is interested in events prior to the fall of a cigarette end or the careless driving he supposes indispensable to fire and accident respectively, only insofar as he supposes knowledge of them of practical utility in preventing the careless dropping of

cigarette ends or careless driving, respectively. Thus if he supposes many would not drive carelessly unless they had been drinking, he will try to prevent people drinking when they are going to drive. But he would not think it a practical suggestion that fires and accidents should be prevented by exterminating the human race, since he supposes the existence of members of that species a principle reason for the desirability of preventing fires and road accidents.

Careful comparison of the initiating events, however, reveals that the commonsense belief in the practical utility of learning of them is not their only distinctive feature. For each is distinguished as the earliest event in a series which commonsense regards indispensable to the 'effect' (and anything dependent on it) alone. Thus the plain man supposes there are many events of which most of those indispensable to Brown's dropping his cigarette end in the market on Tuesday are necessary conditions. He supposes, for instance, that his buying butter and cheese and selling cabbages there would not have occurred but for the events indispensable to his being there; and he further supposes no future events in Brown's history would occur in the absence of those indispensable to his existing up to that time. Only of the fire and anything he supposes dependent on it, such as the calling out of the fire brigade, does he believe it would not have occurred had it not been for the cigarette end's fall and the subsequent ignitions. Similarly he supposes the series starting with the tsetse fly bites, indispensable only to the dislocation of farming and any

subsequent event dependent on it; while he supposes earlier events in the tsetse fly life cycle indispensable to many other occurrences, e.g. to there being tsetse fly breeding now in that stagnant pool, to tsetse fly breathing, flying etc., here now. In the light of what was written earlier this can only mean that for the plain man the initiating event is the first term in a series of a type which under given circumstances is indispensable only to an event like the effect (and to anything dependent on this).

It seems clear however that the plain man does not regard the initiating event solely as an indispensable condition of an event of one specified type and its dependents. For he does not say merely that the cigarette end's fall made the market blaze possible, but that it 'started' it. Similarly he says, not that tsetse fly bites and careless driving made possible dislocation of farming and accident respectively, but that they 'brought them about'. Commonsense, that is to say, whether or no it regards a 'causal series' as necessary throughout, supposes the initiating event as somehow prompting or stimulating the occurrence of the 'effect'.

This view of the initiating event is, indeed, not only comprehensible on, but demanded by, the conception of a 'causal series' as inevitable. For clearly if A's occurrence given certain conditions, entails that of B; then the incursion of the former into a situation where those conditions obtain, clearly consists in the prompting or provocation of the latter by forcing it to happen. But it is difficult to see how a 'cause' can prompt without necessitating, as commonsense apparently supposes it to do in

postulating a 'causal series' one at least of whose members is a decision. A 'cause' or condition regarded as so prompting a voluntary action has been described as 'inclining without necessitating', by which evidently has been meant that it stimulated a predisposition to act in a certain way without actually rendering such action inevitable. But this is surely to say simply that it prompted, not the action, but conditions in which it could occur: which is to say that it was in fact no more than an indispensable condition of such action. Probably this is what the plain man means when he treats a 'cause' as 'prompting' voluntary action. But if this is so, his manner of speaking is misleading.

The commonsense account of the 'causation' of voluntary action suggests problems which are, indeed, fundamental to the Aristotelian account of it. This maintains that a rational being freely decides on a given course of action because he recognises ~~this~~ it to be desirable; to which it may be objected: (a) that if he cannot but choose what appears the most desirable of the possible alternative his decision is not free; while (b) if he can choose what appears to be the less desirable of possible alternatives his choice is irrational. There appear to be only two possible accounts of voluntary action capable of reconciling the assertion of its rationality with that of its freedom. (1) Contradiction might be avoided by maintaining that decision is always rational insofar as it is never choice of what seems the less desirable of possible alternatives, while at the same time it is free in that it is

prompted by neither the desirability of a course of action nor anything else. To maintain this consistently would be to hold that decision occurred only when the respective advantages and disadvantages of alternative courses of action offset each other so that each seemed equally attractive at the moment: thus if Tommy has half a crown and he wants both to save it towards additions to his model railway and to spend it on sweets, and he decides to do the latter; one must, on this view hold the imminence of the pleasure of eating the sweets to offset the more lasting character of the distant satisfaction of adding to his model railway. And saying the prospect of the immediate pleasure tempted or prompted him to sacrifice the more distant one, can only mean that the immediate pleasure proved as attractive as the distant one and hence constituted a genuine alternative for him to choose. The main objection to this account lies in the fact that we do seem to choose one alternative rather than another because we suppose the one more desirable than the other. Nor can this be denied with the contention that sometimes a person acts in a certain way not because he wants to but because he suppoes it his duty; for a person does not do what he regards as his duty unless he supposes it desirable, in the long run at least, for any one to do so. (2) If this objection to the above account be regarded as fatal to it, the contradiction may still be overcome by postulating the free choice further back, maintaining that while a normal rational person must decide on the course of action which is

the most desirable of the alternatives open to him, he is free at any moment to desire one course of action more than another. And this account indeed seems to be supported by the evidence of experience.

Thus any consistent account of 'voluntary action' as truly free must postulate at some point a choice which is dictated neither by reason nor anything else. And the plain man, in postulating such free action, must suppose any 'causal series' including, or culminating in it, to contain at least one unprompted member. Hence although he may consistently regard many initiating events as prompting the occurrence of the 'effects' he supposes dependent on them, and probably may regard all of them as prompting that of at least one event succeeding them in the causal series (which may well explain his attributing the role of prompter to all), he cannot regard them as invariably prompting or stimulating the occurrence of the culmination of such series.

If anyone should object that either of the foregoing accounts of voluntary action puts the voluntary agent in the position of Buridan's ass since no one could choose one of two alternatives, whether actions or desires, unless prompted to one rather than the other by some motive; then so far as I can see, if he is to be consistent he has no alternative but to abandon the commonsense conviction that voluntary action is really free. But he cannot justly dismiss the commonsense belief on this ground unless he can justify his own basic premise against arguments denying the possibility of our discovering necessary connections other than those dependent on

arbitary conventions, or those denying on any other ground that any event ever occurs without standing in a reatlion to some one given type of condition, this relation being one in which all such events will be found to stand to like conditions.

It has been seen that for commonsense to regard a continuant as 'cause' of an event through the intermediacy of an event series, is to regard both continuant and series as necessary, and indeed intrinsically necessary, conditions of the 'effect' event. It was remarked, moreover, (with scant attempt at justification) that plain men supposed many 'causal series' inevitable, given the occurrence of their initiating event under certain circumstances. It will be well, in conclusion, both to defend and elaborate the latter assertion, and to say a little more in general concerning the commonsense postulation of necessary connection relative to 'causal series'.

I shall first elaborate my assertion that commonsense postulates necessary 'causal sequence'; and shall then further defend both this and the view of the commonsense conception of 'causal dependence' as intrinsically necessary, which I have maintained.

Necessary sequence, like necessary dependence, need not be intrinsic. Were the universe so arranged (according to a principle of pre-established harmony, for instance) that lighted cigarette ends never fell on dry straw under certain conditions without an ever increasing series of ignitions following; then though there was no intrinsic connection between cigarette end's fall and

ignitions, it would still be true to say that the latter followed the former necessarily. The general attitude of the plain man indicates not only that he regards many causal sequences as necessary; but that he supposes these to be so in virtue, not of an arbitrary arrangement of the universe, but of intrinsic connection between their terms. If one suggest to him that in an universe arranged differently dry straw would not ignite on contact with a lighted cigarette end under conditions in which this is reasonably to be expected in the universe we know, he regards the suggestion as nonsensical protesting that straw simply could not fail to ignite under the accustomed conditions. And if asked why he supposes this is so, his answer indicates that he thinks straw so constituted that, when dry, any burning process in contact with it cannot fail to continue through, and consume, it. He may, for instance, suggest that this is so because dry straw is easily torn in pieces-evidently intending in so doing to assert not merely a regular correlation between this characteristic and inflammability, but rather that straw's parts being easily separated any external encroachment is readily able to destroy the whole by devouring it part by part.

It might perhaps be objected that plain men cannot be held to believe in any necessary connections either of sequence or dependence, let alone intrinsic ones; since they are prepared to accept the possibility of miracles in the shape of both the appearance of 'effects' in the absence of the conditions on which they think them usually dependent, and of deviations from 'causal series' under

conditions given which they normally expect them to occur. Some modern philosophers, knowing few plain men who believe in the possibility of miracles, might dismiss this objection on the ground that the postulation of miracles belongs properly to the realm of theology not that of commonsense. Since, however, not only have the majority of plain men down the ages accepted the possibility of miracles, but this belief is of very ancient origin, it seems to me clearly unjustifiable to attribute to commonsense any view inconsistent with it. I therefore felt bound to discuss the objection in some detail.

It is an objection which seems to me unfounded; since when a plain man accepts the possibility of miracles he is not postulating ~~not~~ a haphazard deviation from accustomed correlations, but supposing that deviations from them can occur given a special condition: e.g. that God wills a deviation to take place on that occasion. He is in effect postulating laws of the form, 'Under given conditions the fall of a lighted cigarette end or match on dry straw will be followed by a general blaze unless God wills otherwise', or 'Under given conditions a fire will not occur if a lighted cigarette end or match is not dropped on dry straw or shavings unless God wills it'. (10) Indeed the fact that whenever plain men have been convinced of a deviation from accustomed correlations not explicable by the variation of natural conditions, they have attributed it to some miraculous power, testifies to the commonsense belief in necessary correlations in the shape of connections inevitably obtaining

unless some supernatural agency intervenes. If it is maintained that we could be justified in postulating no regular correlation which did not obtain solely among phenomena which are, at least in principle, humanly observable; then of course it must be denied that any plain man accepting the possibility of miracles is ever justified in postulating regular correlations. But clearly this would not exclude his postulating them: Ptolemy postulated laws of planetary motion which are unacceptable to the modern astronomer but this is not to say he postulated no laws of planetary motion.

It may perhaps be thought more difficult to reconcile the alleged willingness of plain men to accept the possibility of miracles, with the assertion that they suppose the necessary connections they postulate to be intrinsic. It may be asked how anyone could suppose, for instance, that a fire could be such that it might occur given either the fall of a lighted cigarette end or the willing (or any other agency) of a supernatural being; or how one supposing dry straw's inflammability intrinsic to the loose coherence of its parts, could imagine the fall of a lighted cigarette end on dry straw might be miraculously prevented from 'starting a fire'. The earlier of these suppositions could, however, be held without contradiction were it supposed that any natural 'effect' could be made possible by the will (or other intervention) of a given supernatural being alone; any specific type of 'effect' being held to be such that, in the absence of this intervention, it could occur only if certain natural conditions obtained. It is then analogous to commonsense beliefs about phenomena whose consistency

is readily acknowledged. One such is the conviction that while men and rabbits can dig holes, these latter are such that, in the absence of animal intervention they can appear on the earth's surface only if natural movements occur in parts of the earth or other pieces of the universe (e.g. in the fall of meteorites). The analogy might perhaps be denied on the ground that commonsense assumes a precise correlation between the character of a hole and that of its 'cause'. But this would, I think, be irrelevant to the analogy; since if the general contention about holes is true, it is so because to have the character of being a hole is to be intrinsically incapable of coming to exist without the movement of earth (from some source), which could be true whether or not there were a precise correlation between the character of a hole and that of its 'cause'. That is to say the assertion about the possibility of holes, like that about the possibility of miracles, if it is true is so in virtue of a character common to the type of 'effect' discussed and not in virtue of its being intrinsically dependent on either one given type of 'cause' or on another.

But if the plain man may consistently admit 'miraculous effects' there can be no objection to his supposing, for instance, that a supernatural agent might prevent a fire following a cigarette end's fall by strengthening the coherence of straw's texture during the time the cigarette end lay on it alight. This looked at as pure theory may seem fanciful, but miracles have undoubtedly been conceived on these principles; and plain men have been prepared to accept accounts of them in terms of such principles. Thus, for

example, Daniel is described as being saved from the lions because an angel shut their mouths; (12) and plain men have been prepared to accept the assertion.

I am not suggesting that plain men reconcile a belief in miracles with that in intrinsically necessary connections in terms of the foregoing. Nor do I put forward the foregoing as an adequate philosophical or theological justification of such reconciliation. But I do think it adequate to show that a plain man's acceptance of the possibility of miracles need not be regarded as tantamount to a denial of necessary, or even intrinsic, connection.

It might perhaps be maintained that a plain man's acceptance of the possibility of miracles would contradict the assertion, made earlier, that he need not be regarded as accepting the doctrine of the plurality of 'causes' as this is understood by modern philosophers; but that his attitude is rather that of the coroner's court which assumes a precise correlation between the characters of a 'cause' and its 'effect'. The admission of the possibility of 'miraculous effects' is certainly in principle an admission that an 'effect' can occur in virtue of either of two types of 'cause'. But I do not think this contradicts my earlier remarks concerning the plurality of 'causes'. For by the plurality of 'causes' modern philosophers mean the postulation of alternative phenomenal conditions given which an 'effect' either can or must exist. And clearly to accept or deny this contention is quite different from postulating a possible phenomenal and super-phenomenal 'cause' of

any type of 'effect'. It has indeed already been remarked that to postulate 'miraculous effects' could be to postulate 'effects' of such a nature that, in the absence of supernatural intervention, they could occur only if one specific set of phenomenal conditions obtained. Nor do I think a plain man's belief in the possibility of miracles need practically affect his attitude to coroners' courts and detective stories. For a plain man who accepts the possibility of miracles, does not suppose they occur in the ordinary way; otherwise he would not call them miracles or 'wonders'. He may therefore quite reasonably assume them not to have done so in any given instance, and hence may justly infer a given type of phenomenal 'cause' from the specific character of an 'effect'.

Whether or not one admit the legitimacy of combining belief in the possibility of miracles with inference from one phenomenon to another as its 'cause' or 'effect', however, one cannot deny that the two have been combined without consciousness of contradicition. Thus, for instance, Chesterton who wrote in defence of the possibility of miracles, also wrote detective stories in which he assumed the legitimacy of inferring precisely defined phenomenal 'cause' from the occurrence of an 'effect' of a given type: for example in one story he assumed it legitimate to infer that a man stabbed to death with a curved knife must have been murdered by a doctor who alone would have known how to reach his heart with so unusual an instrument; (12) and in another he treats the character and condition of a hall as justifying the inference that a man had there fired at his reflection in a mirror, mistaking it for his enemy. (13) Nor is

Chesterton's holding both beliefs a mere oversight, due to his forgetting the one while he is appealing to the other. For he makes it a moral of several stories (16) that his Father Brown, who is from the start committed to belief in the possibility of miracles, is the character who insists on looking for a naturalistic explanation of a mystery. Nor is the combination of these beliefs peculiar to Chesterton who might, with justice, be regarded as a not very typical example. Dorothy Sayers and R.A.Knox have also written both works testifying to a belief in the possibility of miracles, and detective stories assuming the possibility of inferring a precisely defined phenomenal 'cause' from the character of a given 'effect'. Whether or no one thinks he should, one cannot therefore conclude that a plain man who accepts the possibility of miracles, will reject such inference.

In addition to evidence of a combination of beliefs which may in fact be held (whether legitimately or not) some of Chesterton's stories suggest, in the reasons they make Father Brown give for rejecting a supernatural explanation in a given instance, further criteria to which the believer in miracles may appeal in discounting their possibility in any given situation. These lie in the conviction that it is only reasonable to expect their occurence when this can be supposed to further the purposes of the supernatural being responsible for them, and to be consistent with the nature ascribed to him.

The view of an 'effect' as essentially such that, under given conditions, it is intrinsically incapable of existing in the absence of a specific type of 'cause', which I have ascribed to commonsense, is the inverse of that maintained by H.W.B.Joseph (16) - namely that a 'cause' is essentially such as to entail the occurrence of its 'effect' under given conditions. I have further maintained that commonsense also postulates many 'causes' in the latter sense. It may be objected that in so doing I am supposing A's being a 'cause' or 'effect' is a matter of definition to commonsense, and that this is blatantly inconsistent with commonsense usage. For instance it may be pointed out that whereas plain men used to call foul smells 'cause' of fever, many of them now repeat the scientists' assertion that it is not the smells but the bacteria found where the former seem to emanate, which 'cause' these diseases. It will be argued that, were my account of the commonsense conception of 'causal sequence' correct, plain men would have refused to apply the name 'fever' to a condition which they discovered was not dependent on smells; and would have refused the title 'foul smell' to a phenomenon which they learned did not entail sickness under given conditions. This line of argument has been provoked by those philosophers who have written as though they were always indubitably aware of the intrinsic connection between 'causes' and 'effects' which they postulated. And it is clearly a valid criticism of those only who claim both that their 'causal' assertions postulate intrinsically necessary connection, and that they are necessarily true. For to suppose there can be

no B independently of an A if A 'causes' B, is to suppose neither that A must 'cause' B nor that it infact does so. There is therefore no contradiction in saying; 'I thought there was an intrinsic connection between A and B, but I find I was mistaken'. And this I think is the position of a plain man in rejecting a 'causal' assertion which he previously accepted.

Certainly the plain man normally assumes the truth of his 'causal' assertions; unless he wishes either to deceive or to weave fictions for his own amusement or that of others, his purpose in making a statement is to communicate to others what he thinks true. And indeed he sometimes supposes that he perceives an intrinsic connection between 'cause' and 'effect'. But there is no indication that he supposes all his 'causal assertions necessarily infallible. There is, therefore, no reason why he should not at the same time admit some to have been mistaken without renaming the previously postulated 'causes' and 'effects'. And indeed since his practice indicates both that he is prepared to do the latter, and that he supposes 'causal' dependence intrinsically necessary; there seems no alternative but to hold that while he supposes an event is never 'caused' by a continuant save when its dependence on the latter is intrinsically necessary, he does not suppose his assertion of such a connection to be always necessarily true.

To sum up. The plain man is prepared to call a continuant 'cause' of an intervening event series if, and only if, he supposes three things: (a) that the initial event in that series

is part of the continuant's history: (b) that the 'effect' event is such that it could not occur under given circumstances unless the event series (or one specifically identical with it) had occurred immediately before; (c) that the series is such that under the specified conditions it is indispensable only to the 'effect' or a similar event, and to anything dependent on this. Further he sometimes supposes the occurrence of the series under given conditions entails that of the 'effect'; and he usually holds that of the initiating event to entail thus that of at least the first of its successors. Moreover, although ~~in~~ he intends to postulate intrinsically necessary dependence in thus calling a continuant 'cause' of an event, he does not claim such assertions to be necessarily infallible and hence can admit them to be mistaken without adopting new names for the erroneously postulated 'causes' and 'effects'.

In the foregoing pages I have merely tried to analyse an important commonsense usage, to justify my analysis, and to argue that the plain man could (without contradiction) hold the views I have ascribed to him. I have said nothing as to his justification for adopting them at all. Before doing this I shall briefly examine the other commonsense uses of the term 'cause' which I noted, after which I shall be better able to discuss the plain man's right to notions basic to any of them.

(b) Examination of the remaining examples.

The remainder of my examples are important in illustrating the variety of commonsense usage rather than as introducing new

notions. For so far as I can see none of them illustrates a notion which is not implicit those already discussed, or at least in what these are normally intended to assert. Their variety alone, however, is significant for my purpose; which, as I indicated at the outset, (1Ø) is not merely to examine notions underlying various causal assertions but to try to find some common denominator to which the commonsense uses of the term 'cause' are reducible.

Each of the causal explanations examined above could have been summarised as well by giving the title 'cause' to what I called the initiating event, as by applying it to the continuant in whose history it occurred. Indeed in the paragraph accompanying the headline 'Cigarette and may have caused market blaze', a cigarette end's fall is specified as the probable 'cause' of the blaze. And his general practice leaves no doubt that the plain man would be equally prepared to call the safety lecturer or his careless driving 'cause' of the accident, and tsetse fly or their bites 'cause' of the dislocation of farming, etc., The first of the remaining examples - 'Devaluation of the pound causes trouble in shipyards' - insofar as it postulates an event complex as initiating a series of such complexes and which is indispensable to its culmination, and to this and anything dependent on it alone, summarises a type of 'causal explanation' fundamentally similar to that already discussed. It therefore demands little comment save in noting the lesser differences between this explanation and those summarised in the earlier examples. These are three:

(a) the initiating event complex, unlike that postulated in the second example - is heterogeneous; (b) some members of the series it initiates, or at least some members of the complexes constituting it, are not actual events but merely the possibility or impossibility of certain types of events occurring - e.g. the possibility or impossibility of the Venetian shipyard workers in question buying certain commodities with their wages; (c) despite its formal similarity to 'tsetse fly bites cause trouble', the sentence 'Devaluation of the pound causes trouble' cannot be conveniently repladed by one postulating continuants as 'cause'. The impossibility of such translation is not due to the plain man's supposing the events composing the initiating complex any less attributable to the histories of continuants than tsetse fly bites. It rests on the fact that by 'devaluation of the pound' he means a heterogeneous collection of events attributable to numerous continuants in whose histories are so many and varied events that to specify them is not to suggest their relation to one event or event complex rather than another.

The next example 'Rain causes many crashes' introduces a greater difference of usage; for here the title 'cause' is applied neither to initiating event nor to continuant to which this is attributed, but to a condition on which the 'causality' of an initiating event depends. For although rain is supposed by commonsense to consist in an event complex attributed to a number of homogeneous persistent somethings-namely raindrops,

this complex is not viewed as initiator of a series indispensable to crashes as such. Instead it is regarded as indispensable to the occurrence of crashes in that, rain, having fallen on a race track, the latter became wet and slippery; i.e. such that tyres revolving on it may easily skid. I think the plain man supposes that there are circumstances - a given condition of a car, speed at which it was travelling, and degree of recklessness or limit of skill of the driver - given which the wetness of the track will entail the occurrence of a crash. But he certainly does not regard the 'causal connection' between rain and car crashes to be necessary in the sense in which he supposes that between a lighted cigarette end's fall and consequent blaze. For although he thinks there are conditions given which a lighted cigarette end's fall on dry straw would not be followed by a general blaze, he holds that it is never true to call a cigarette end's fall 'cause' of a fire in the sense of initiating a series culminating in it unless the fire's subsequent occurrence was inevitable given the cigarette's fall. But he is prepared to call rain 'cause' of a car crash when he supposes its making a road or track surface slippery to have merely rendered the crash possible or probable:i.e. to have been merely that 'in the absence of which the crash would never have occurred.'

This example is also interesting in that the title 'cause' is applied not only neither to an initiating event nor to a continuant in virtue of that event; but to a condition both

prior to that event, and unrelated to such an event apart from being indispensable to its initiating role. In other words it summarises a 'causal explanation' which goes beyond the initiating event. It therefore provokes the question why 'causal explanation' is not always traced to the initiating event and no farther. This is one of the general questions which I shall discuss later.

In the sixth example - Professor Manley told me afterwards that the cause of the increased temperature might lie in some type of variation in the atmosphere or the behaviour of ocean water' - the possible 'causes' postulated are again event complexes. And, like that postulated as 'cause' in the previous example, they are complexes which the plain man regards as constituting a state of a continuant, namely a section of the earth. The 'effect' however differs completely from its predecessors in that it is regarded neither as event nor event complex (either homogeneous or heterogeneous), but merely a persistent chacteristic or a part of the universe: namely its temperature always or generally being above a certain minimum. The plain man would admit a change of temperature to be an event, and would doubtless suppose that to assert the postulated effect (i.e. temperature within certain limits) is to postulate certain such events; but the title 'effect' is applied not to the events but to the limits within which they occur.

This example is also important in that the postulated 'effect' is not said to be such as to be dependent on a precisely specified 'cause', but merely that it is such as to be dependent on a 'cause' of a given general type (i.e. events in a medium in contact with the section of the earth in question). And it is assumed that this 'cause' is such as to render the effect inevitable under given conditions.

The seventh example - 'The high temperature caused the lines to expand with the result that they twisted out of shape derailing the express' - while positing an effect which commonsense regards as an event or event complex, postulates a 'cause' which plain men regard as neither: namely once more the temperature of a portion of the earth. Doubtless, the plain man would admit readily enough that the lines did not, and indeed could not, expland until the earth, and consequently they, became a certain temperature - i.e. until an event occurred. But here, as with the application of the title 'effect' in the previous example, the name 'cause' is applied not to the event of becoming a given temperature; but to what is regarded as the persistent state of being a given temperature. Clearly the earth's being in this condition is regarded as entailing the lines, which lie on it, being so; and the latter as entailing the occurrence of those events in the lines' history described as their expansion.

Another distinctive feature of this example is that in effect two successive 'causal connection' are asserted; high

temperature is said to 'cause' the lines' expansion; and then from this latter the lines' twisting out of shape and the subsequent derailment of the express are said to result. In the other examples, the title 'cause' is applied to, or in virtue of, the earliest of the factors specified on which the latest is supposed to depend; that is to say the title 'effect' is applied to that ultimately to be explained; the title 'cause' to, or in virtue of, the earliest point to which its explanation is traced. To be analogous to its predecessors in this the seventh example would have had to specify the high temperature as 'cause' of the derailment. This example thus draws attention to the fact that the plain man is prepared to describe as a relation between 'cause' and 'effect' either the whole or a part of an explanation which he is considering.

The eighth example, 'Brumas causes traffic enquiry', is completely different from its predecessors in that it applies the title 'cause' to a condition regarded as indispensable to its 'effect', not simply in virtue of its character (or that of an event in its history) in itself but only insofar as this renders a course of action desirable. In doing so it is not introducing the notion of a condition different from any implied by the other examples, for as has been seen both the second and fourth examples postulate conditions of this type. The novelty lies simply in applying the title 'cause' to such an one. As I have discussed the commonsense view of the role of such conditions I need say no further on that score here. I need only

remark that the motive-condition is here regarded cause of an event (or event complex) which would not have occurred had it not been for a series of event complexes, some of the factors in which are regarded as necessary and some as voluntary, the occurrence of the series being dependent in its turn on Brumas' presence at Regent's park rendering a certain course of action, namely going there - desirable to many people. The role of the motive 'Cause' is thus to some extent analogous to that of an initiating event insofar as this is regarded as an indispensable condition of a subsequent series of events.

'Cause of nurse's death unknown', the ninth example, is important in evidencing the plain man's willingness, and indeed aptitude, to postulate some 'cause' of a given event ~~even~~ though he is unable to postulate any specific type of condition, which he even regards as likely to have fulfilled that role. In each of the previous examples it has been seen that, in postulating an 'effect', the plain man has been postulating something intrinsically incapable of occurring under certain circumstances unless related to some one type of condition. It was further seen that he may use a term such as 'fire' or 'death' to designate a general type of event whose individual occurrences may differ specifically to quite a considerable extent. And it was seen that, in postulating an 'effect' such a general type, he intended to assert that to be 'of this type was to be intrinsically incapable of occurring in the absence of a condition of one of a set of alternative types; though he often (and perhaps always) assumed

that, were the 'effect' and the obtaining conditions specified with sufficient precision, the precise character of the 'cause' could be inferred. When therefore he makes an assertion like 'Cause of nurse's death unknown', he is generally asserting something to be of a general type and as such intrinsically dependent on a condition of one of a given set of types; but that he knows too little of the character of effect, prevailing conditions, or both, to be able to specify the 'cause' precisely. The ninth example is thus seen to be analogous to the seventh in this respect, since the latter asserts an increased temperature of part of the earth to depend on one or other of two types of condition. And the attitude it reveals is clearly that which leads plain men to support the continuation of a hitherto unsuccessful search for the 'cause' of a disease such as cancer.

It may be asked what could be the plain man's ground for such a belief. Admittedly he often knows too little of even the general character of a postulated 'effect' to justify the conclusion that it is intrinsically incapable of existing in the absence of conditions of one of a set of specific types; or even to defend the view that it is intrinscially dependent on a condition of a general type, the possible specific exemplifications of which it is impossible to enumerate completely. And the fact that there are occasions when he cannot discover the 'cause' of such an 'effect' shows that the belief could not be justly based on inductive grounds. Either, therefore, the ~~commonsense~~ plain man's confidence in the existence of 'causes' where he can discover

none, is groundless, or it rests on either of the two following convictions: (a) that all the 'effects' specified by commonsense can be seen to be intrinsically incapable of existing independently of anything external to themselves; (b) that nothing is inexplicable in the sense that nothing, whether within or external to it, is essential to its existence. The first of these convictions would, by itself seem to be as palpably unjustifiable for commonsense as the belief that a given 'effect's intrinsic dependence on a 'cause' of a certain general type is always observable by the plain man. The second, whether defensible or not, seems to be held unshakably by plain men and is, moreover, often made the explicit ground of a contention that something is intrinsically dependent on a condition external to itself. Thus, for instance, one frequently hears remarks such as 'The fire couldn't have started itself', The chair couldn't have moved itself', which are in effect stating a fire or a chair's movement can be explained only by reference to something other than itself.

The belief that nothing is inexplicable in this sense seems, therefore, to me the most likely source of the plain man's belief in undiscovered 'causes', as well as being that of his conviction that any postulated 'cause' is indeed intrinsically indispensable to its 'effect' even though he may be unable to perceive the intrinsic connection which he postulates between them. It is, moreover, a belief which is very important for any general discussion of 'causation', since philosophers and scientists have found it

as difficult to discard as do plain men, and it is therefore often implicit in what they have written either about the 'causation' of some particular 'postulated 'effect' or about 'causation' in general. It will be discussed in the assessment of the common-sense acceptance of notions fundamental to its 'causal' assertions, which forms the concluding section of this chapter.

The last two examples - 'Lack of boys' clubs is one cause of juvenile delinquency', and 'someone to love and someone to love him is a vitamin without which no individual can develop aright. And there (in its absence) you have the chief cause of juvenile delinquency.' - are distinguished from their predecessors in a very important respect, namely in applying the title 'cause' to the absence of something. The postulation of an 'effect's dependence on the absence of something introduces no new notion. It was seen at the outset that in regarding a cigarette end as 'cause' of a fire the plain man supposes its fall's being followed by the fire to depend on the absence of intercepting factors such as the application of water or sand etc. The application of the title 'cause' to such a negative condition is, however, very important for the definition of that term.

The plain man does not, of course, ever suppose an effect dependent on a negative condition alone; when he postulates lack of boys' clubs as 'cause' of juvenile crime he is supposing the latter dependent on a complex of events and other positive conditions, from which one specified type of factor - namely

boys' clubs-is absent. He does not even suppose a given type of 'effect' necessarily dependent on any complex lacking a factor of a given type. He may, for instance, think that in one type of situation lack of boys' clubs 'causes' juvenile crime while in another it does not. On the other hand he sometimes holds absence of a given type of condition may 'cause' a given 'effect' under any circumstances. A person's lacking someone to love and someone to love him is evidently regarded like this in the last example; and so is lack of iodine in an organism when its presence is regarded indispensable to normal development. Yet in postulating lack of A either as always or as sometimes 'causing' B, the plain man does not suppose he is merely offering a translation of a sentence of the form 'Given X, the presence of A, B. & C causes Y'. For he is intending to signal out the role not of positive factors, but of the absence of something from among them, as an indispensable condition of an 'effect'.

As in the second, fourth and eight examples, the 'causes' postulated in the tenth and eleventh are not regarded by commonsense as entailing their 'effects', which latter are viewed as voluntary actions. Their relation to their 'effects' is, however, thought somewhat different from that of the conditions of voluntary actions previously discussed. For these are regarded as rendering certain actions more or less probable, by entailing or constituting something which can be avoided or achieved by those actions. But the 'causes' postulated in the last two examples are generally regarded as rendering a course

of action more or less probable, by being conditions given which anyone may become the sort of person likely to find a given type of action desirable: e.g. one who has no harmless outlet for his energy, or one who is unhappy and frustrated and so liable to want to vent his resentment on other individuals, society at large, or even inanimate objects.

(c) Examination of some ambiguities in commonsense usage.

The plain man has been seen to be prepared to apply the term 'cause' equally to initiating event, continuant in whose history this is supposed to occur, or to another condition prior to the initiating event. And he has further been found prepared to describe either the whole or a part of an explanation he is proffering, as a relation between 'cause' and 'effect'.

This variety of usage, however does not testify to the absence of any common denominatory to which the plain man's 'causes' are reducible without losing their distinctive 'causal' role. The foregoing paragraph reaffirms what was illustrated by the examples just discussed - namely that the plain man applies the term 'cause' to nothing which he does not regard as indispensable to the 'effect' he ascribes to it.

Nor does it spell mere caprice. Whether a plain man postulates one or another type of condition as 'cause' of a given 'effect', seems to depend on the question he intends his 'causal' assertion to answer. And this in its turn seems often to depend on considerations of practical utility, and always on the existence of some motive for interest in its answer.

Thus when he is satisfied that an accident could have been prevented simply if careless driving had not occurred he will not seek further than this for its 'cause'[1]. If on the other hand he thinks A's driving not in itself of a type indispensable to the occurrence of an accident, he traces the latter's explanation further back until he finds a factor such as rain, whose conjunction with that driving he supposes to have made the accident possible. Similarly when a coroner's court seeks the 'cause' of X's death, it is looking only for a condition (or conditions) of his death which will provide evidence as to whether it was natural, suicide, or murder; and if the latter, as to the identity of the murderer as well. Again, if he sees no need for a detailed explanation, the plain man merely describes that to be finally explained as 'caused' by the earliest factor on which he is asserting it to be dependent; whereas if he thinks it necessary to specify the details of the connecting process, he describes the various dependences within it as connections between 'cause' and 'effect'. Thus he simply calls a cigarette end 'cause' of a fire, and tsetse fly 'cause' of cattle plague, when he supposes at least the general character of their connection with those 'effects' will be understood by his readers or hearers; but when he thinks the nature of the link between high temperature and an accident might not be so obvious, he specifies the intervening 'causal connections' by which they are linked. Or again he may simply postulate 'causal connection' between the first and last links of the chain alone, as a convenient summary of the detailed explanation he is introducing or discussing; or, if he is

a newspaper editor, and first and last links are not of a type usually related as 'cause' and 'effect', he may simply assert their 'causal connection' in a headline in order to attract attention to the more detailed explanation following it. The headlines 'Small insect causes big trouble', and 'Devaluation of the pound causes trouble in shipyards', seem to reflect the influence of this latter motive.

It might, perhaps, be objected that sentences specifying severally initiating event, and continuant to which it is ascribed; and even more thos specifying severally initiating event, inanimate object, and person to whom it may be ascribed (or even, in addition, a characteristic in virtue of which it can be ascribed to a continuant); are in effect tautologous. Thus 'a cigarette end caused the fire' might be though merely a shorthand expression of 'the fall of a cigarette end caused the fire'; and this in its turn as a brief form of 'Someone's (Or Jones') dropping a cigarette end caused the fire.' Similarly 'Jones caused the fire' might be regarded as shorthand for both the latter type of assertion and 'Jones' carelessness 'caused the fire', since it was in dropping the cigarette end and allowing it to be dropped that Jones and his carelessness respectively, earned their title to be called 'cause' of the fire. This, however, would be mistaken. Certainly they all refer to the same event, either directly or indirectly; but the plain man uses one or other of these types of sentence in order to specify one or other aspect of that event. And, moreover, he often has very good reason for wishing to specify one aspect of it rather than

another. The foregoing should have made the importance of the initiating event to the plain man, sufficiently clear. The ability to refer to it briefly is thus evidently essential. But it may be equally necessary to specify a continuant in whose history he supposes it to occur, whether he so attributes it to one or more. Thus when a man is found shot through the heart evidently murdered, if justice is to be satisfied and society protected, it is necessary to distinguish the person who pulled the trigger from other conditions of the event. Furthermore, knowledge of the type of gun used may prove an useful clue to the identity of the murderer. Again, if fires or murders are to be prevented, it is valuable to be able to specify any characteristic in people which, it is reasonable to suppose, renders them liable to drop lighted cigarette ends or commit murders respectively.

(d) The commonsense conception of causation.

The variety of the foregoing examples makes it clear that none of the definitions of 'causation' which are familiar to the modern British philosopher, (18) is consistent with commonsense usage. To most modern philosophers, to call an A 'cause' of a B, is to say that it is reasonable to expect that whenever an A exists under given conditions it will stand in a certain relation to a B. And some suppose that to call an A 'cause' of a B, is to assert that whenever an A exists under given conditions, it will stand in a given relation to a B; and yet others hold that to call an A 'cause' of a B, is to say that under certain conditions the existence of an A entails that of a B. It was seen that the plain man postulates some 'causes' which he

supposes necessarily followed by their 'effects' under given conditions. But he was also seen to suppose there are 'causes' which it is not even reasonable to expect to be always correlated with the 'effect' attributed to them; since he is prepared to postulate a 'cause' of voluntary action, which latter he regards as a choice of one of two or more equally possible alternatives.

L. S. Stebbing, who overlooks this, further defines the commonsense notion of 'cause' in terms of activity. (19) It is indeed true that the plain man supposes some continuants to be 'causes' in virtue of what they do to something. Thus he regards the tsetse fly as putting the bacteria into a blood stream and so starting a disease by its action; he thinks a man may 'cause' an accident by pulling and pushing various parts of his car (e.g. steering wheel, accelerator, etc.). Moreover, it seems likely that the commonsense notion of causation originates in experience of actions by which a person seems to alter his invironment. The baby learns that when he makes certain muscular efforts, visual data (which he comes to associate with his toes) alter; and that the experience we describe as putting his toes in his mouth becomes possible. He learns also that unless he makes those efforts this experience does not occur. He finds likewise that he can 'move' his rattle, bricks, etc.; and ordinarily he does not see them move unless he can suppose them 'moved' by someone else. And it is in like experience that the plain man finds his most convincing evidence of 'causal dependence'. Tell him that the death of X, which he supposes

characteristic of arsenical poisoning, was not due to arsenic - and he will think it highly improbable. But he will not suppose it wholly unthinkable: he may admit the possibility of factors, in either arsenical poisoning or the present instance, of which he knows too little to be sure on the subject. But tell a plain man that the existence of a table he has made does not depend on the actions of his hands and tools, and the physical and mental effort he experienced in making it - and he will regard the suggestion as arrant nonsense. AAnd his reaction is the same should one suggest that his arrival at the end of an arduous climb, or long walk, was not dependent on the muscular efforts he thought he experienced in himself in thë process of achieving this.

The plain man, however, was seen prepared to apply the term 'cause' not only to something other than activity, but even when he supposed activity irrelevant to its 'causal' role as such. Thus he was seen to apply the title to what he regarded as a persistent quality of a continuant - namely its temperature; to the absence of a given type of factor from a certain situation - namely lack of boys' clubs and lack of love; and to a continuant (namely a polar bear cub) in virtue, not any activity on its part, but simply of its having a specific character and being in a given place at a certain time. Certainly philosophers have described 'causes' of all three types as 'acting on' that in which they are said to 'cause' change. But clearly in doing so they have simply treated 'act on' as synonymous with 'cause a change in', irrespective of the ordinary 'sense' of 'act'. And that it is the ordinary sense of this

of which L.S.Stevving is thinking in defining the commonsense notion of 'cause' in terms of activity, is evident from t he general tenor of her discussion, and in particular from her citing as an example altering the shape of india rubber by squeezing it.

It was seen that for commonsense a 'cause' is always intrinsically indispensable to its 'effect'. Nor can I discover any other characteristic common to all the 'causes' postulated by commonsense.

(iv) Further discussion of some basic presuppositions of the commonsense conception of cause.

The conception of a 'cause' as intrinsically indispensable to its 'effect', accounts for the plain man's practice of treating 'cause' and 'explanation' as synonymous. For if X cannot occur in the absence of a certain condition (whether contemporary with, or prior to, itself), then clearly the existence of that condition contributes to the explanation of B. And if it is supposed that the introduction of that condition into a certain set of circumstances suffices to make X possible, then the introduction of that condition is naturally and legitimately regarded as explaining the existence of X in its accustomed relation to that condition.

In all the examples examined above, as in the usual application of the terms, the 'cause' is an existent other than its 'effect'. This perhaps seems a rather needless remark since this is so often a matter of definition (20) Today, for instance, most philosophers who suppose the term applicable to a non-formal relation, regard a 'cause' and its 'effect' as distinct events or at least as distinct phenomenal complexes. But this has not been so with all philosophers for whom a 'cause' is a necessary condition of its 'effect'. Thus, for instance, both Spinoza and St. Thomas Aquinas postulate the existance of a God whose nature is the necessary condition of his existence, the former on this account describing Him as 'causa sui' (21) while the latter on precisely the same ground insists that He is 'uncaused'. (22) Evidently the question whether 'cause' is to be defined without qualification as

'necessary condition', or as 'necessary condition distinct from that dependent on it', is beyond either the scope or needs of commonsense; but it is desirable, for the sake of clarity, to note the possible distinction within the commonsense definition.

It has been seen that the plain man asserts some 'causal dependences' whose postulation he can justify neither by induction nor by claiming insight into their intrinsic character; and that unshakable commonsense beliefs such as that a given fire would not have occurred had not a lighted cigarette end or match been dropped, and that a fire never occurs without some 'cause', must be supposed to rest on the conviction that nothing is inexplicable. And this belief was seen to have also been very important in philosophical and scientific treatment of 'causation'. Something further must therefore be said about it.

In the first place it is clear that this belief is not always identical with, though doubtless fundamental to, that which a philosopher intends to assert in postulating 'universal causation'. That it is not identical with that asserted in postulating 'universal causation' by those who suppose the 'cause' of an A to be of a type either always, necessarily, or reasonably expected to be always, correlated with an A under given circumstances, should have been made sufficiently clear. And it is as evidently not that asserted in postulating it by those interpreting 'universal causation' as every event depending on another which precedes it, whether a 'cause' be regarded as entailing or as either certainly

or probably followed regularly by a given type of 'effect' or not. For an event's occurrence might conceivably be made possible by factors other than, and excluding, a prior event. To disprove 'universal causation' in any or all of these senses is not, therefore, to refute the basic commonsense premise, though this fact alone does not suffice to justify the latter.

I have been able to discover no argument which could be regarded as proving that everything is explicable in the sense that there is some condition necessary to its existence; but neither have I been able to discover any argument which could be regarded as disproving it. So far as I can see, the only line which a defence of either its assertion or denial could take would be to point out the absence of any just ground for supposing the contrary must be true. If a 'cause' is regarded as explaining in the sense of entailing the existence of its 'effect', the use of such an argument against the postulation of 'universal causation' would be self-contradictory if it was intended to assert that nothing entailing 'universal causation' is discoverable; since this would clearly be to assume what is being denied, namely that nothing is unentailed. But against the narrower commonsense principle that nothing is inexplicable in the sense that there is no condition necessary to its existence, this objection is legitimate. Since, however, it may be raised equally against the denial of universal explicability in this sence, it is incapable of showing either its affirmation or denial to be more reasonable than its contrary.

Nevertheless plain men, scientists, and at least most philosophers, cannot deny universal explicability without self-contradiction. It has been seen that, unless he assumes it, the plain man has no right to many particular and specific causal assertions; and hence without it has even less justification for assuming any general principles of causal dependence. Nor is this limitation confined to commonsense. Some philosophers and scientists have supposed there are causal connections which, in the light of scientific analysis, may be seen to be intrinsically necessary. But most of the connections of which they have supposed this to be true can be so regarded only if the universality of the laws of motion is first assumed. A good example of this is the intrinsic necessity which C.A. Mace sees in the connection between impact and movement among billiard balls. (23) And so far as I can see there is no intrinsic necessity in the laws of motion taken by themselves. At best, therefore, the philosopher and scientist, who make suppositions such as that a billiard ball will not move irrespective of the nature of simultaneous and prior conditions, must be supposed to postulate many 'causal dependences' which cannot be seen to be intrinsically necessary unless belief in the universality of the laws of motion can be supposed justified on some other ground than analysis of their character and that of motion, alone.

The possibility of a Kantian justification of generalisations will be discussed fully below; (24) here, therefore, I need only remark that I do not accept it. And induction alone can no more justify philosopher and scientist in either accepting generalisations,

or supposing that any given phenomenon would not have occurred irrespective of the character of simultaneous or prior conditions, than it can justify the plain man in doing so. Certainly if there is good ground for supposing a correlation to have always occurred in the past it is more reasonable than not, on this ground alone, to expect that it will continue to occur in the future. For if one does not expect this one has no criterion for expecting one thing rather than another, and hence no motive for action. Moreover, if a correlation has occurred one does at least know that it can do so, whereas for all one knows, those that have not done so may practical impossibilities. Furthermore, if the universe has always exhibited regular correlations in the past, all the available evidence supports the view that it is an ordered system. But, unless some principle of 'universal causality' is acceptable, neither philosophers nor scientists have very strong inductive grounds for supposing any correlations to have always occurred in the past. For although the precise analysis of experiments may justify a certain number of assertions of the form 'An X has never been known to occur in the absence of a Y', the experiments justifying this assertion are relatively few in number; while, theoretically at least, an infinite number of experiments which might either confirm or falsify it, is possible. Thus unless some form of 'universal causality' is assumed, the probability that even the most strongly attested 'causal dependence' will occur in the future, is negligible. If, therefore, every known phenomenon could be said to testify thus to the existence of laws of 'causal dependendence',

this in itself would not serve to justify belief in 'universal causality' in any form. And, indeed, so far from this being so, the majority of experienced phenomena are not subjected to nearly precise enough analysis to allow of their being justly regarded as testifying to universal laws in a sense consistent with the demands of science and philosophy.

Thus unless some form of 'universal causality' is assumed prior to any appeal to induction, that appeal is in itself fruitless and wholly unjustifiable. And although to assert universal explicability, in the sense in which has been said to be assumed by commonsense, is not to assert 'universal causality' in every sense in which philosophers have interpreted that phrase; to assert universal causality in any of these latter senses is to assert universal explicability. Thus, for instance, to assert that no event occurs in the absence of conditions given which it always occurs, is to say that every event is dependent on some condition necessary to its existence. Universal explicability is thus the least which must be assumed to justify most refusals to admit either the possibility of probability of anything existing irrespective of the character of any simultaneous or prior condition.

As has been indicated such refusals are made, not only by plain men, but also by scientists and most philosophers. Russell has pointed out (25) that the most advanced sciences no longer deal directly with 'causal laws' strictly so-called. But it remains true that the findings of these sciences rest in part on the

assumption that instruments will not react irrespective of the nature of simultaneous and prior conditions, which since it cannot be seen to be intrinsically necessary can be justified only by assuming universal explicability. Furthermore, even when they have regarded this assumption as unjustifiable, philosophers (with the possible exception of the extreme Greek sceptics - though one is tempted to suspect these of playing a part for the sake of showmanship)—have been unable to discard it. Thus Hume, while ruthlessly affirming its unjustifiability, yet admits it to be integral to human thought; and shows himself to be no exception to the rule, despite his critical attitude, by seeking the 'causes' of the belief in 'necessary connection' without even mentioning the possibility that it might occur irrespective of prevailing conditions; although he has denied the possibility of either perceiving intrinsic connection between any 'cause' and its 'effect', or of justifying the postulation of a law of 'causal dependence' by induction without assuming 'universal causality' - hence denying the justification of assuming a belief or any other phenomenon to have a 'cause' without postulating 'universal causation'. (26) Generally speaking, therefore, neither plain man, philosopher, nor scientist can deny universal explicability without self-contradiction.

The assumption that nothing occurs haphazardly seems to have proved useful in the past in leading people to suppose certain courses of action might reasonably be expected to prevent the occurrence of certain types of phenomenon, these expectation seeming to be justified in the event. Thus it may be supposed to have

led Ross to expect malaria would not occur in the absence of mosquito bites: and it has since been found that when mosquitoes have been eliminated from an area the disease has ceased to occur there. Plain men and some philosophers would claim that a scientist's or philosopher's search for as yet undiscovered 'causes', or any other research assuming that phenomena do not come into existence haphazard, is evidently intrinsically impossible in the absence of belief in universal explicability. If this contention is justified then the belief may justly be claimed invaluable to research. But if the premise is not justified non-inductively, the claim can at best be regarded as not inconsistent with the known facts. If it can be supposed true to say that no one has been known to look for anything unless he supposed it to exist, then it may be maintained that the available evidence supports the claim for the utility of the belief; and it may justly be held more reasonable than not to hold it given that evidence. But as has been seen, without assuming that whose utility is in question, such an argument can confer only a negligible degree of probability on its conclusion. (27)

NOTES

1. Cf. Logic Pt. 111 Ch V11 pp.84-5
2. Perception (Methuen 1950) Ch.V11 pp.181-2
3. The Foundations of Empirical Knowledge Ch.1V Sect.17.pp.176-9
4. Perception p.182; The Foundations of Empirical Knowledge Ch.V Sect.23 pp.239-40
5. The Foundations of Empirical Knowledge. Ch.V.Sect.23 p242.
6. Cf.Perception Ch.1X pp.286,293
7. Perception pp.287-93
8. I compare commonsense usage with the practice of modern philosophers only, in this respect; since Aristotle, for instance is near enough to the commonsense position to write not only of the 'causes' of given types of 'effect' but also of the 'causes' of particular phenomena e.g. this statue or that war.
9. L.S.Stebbing in discussing the commonsense notion of cause (A Modern Introduction to Logic (Methuen 1950) Pt.11 ch.XV pp260-3) does not make this distinction sufficiently explicity, although it is implicit in her examples.
10. Modern Introduction to Logic p.263
11. His attitude is thus basically that of A.J.Ayer (The Foundations of Empirical Knowledge pp208-11), when the latter denies any consistency between the occurrence of miracles and determinism, on the ground that their occurrence would reveal not the non-existence of 'causal uniformity' but merely a mistake in the formulation of such uniformities. Though clearly A.J.Ayer would not be prepared to accept the type of law postulated by the plain man in assuming the occurrence of miracles.

12. Daniel Ch. 6 v.22

13. The Wrong Shape: The Father Brown Stores (Cassell 1949) pp.89-103.

14. The Mirror of the Magistrate: ibid pp.467-82

15. Cf. those grouped under the title 'The Incredulity of Father Brown': ibid. pp.319-44

16. Introduction to Logic p.408

17. pp.72-3

18. In discussing the views of modern philosophers I am normally referring solely to views current in Britain. My remarks may not therefore always apply to other modern schools of thought: e.g. French existentialism or neo-scholasticism.

19. Modern Introduction to Logic pp.260-1.

20. Cf. for instance W.E.Johnson, Logic (Cambridge University Press 1924) Pt.111 Ch. V11 p79.

21. Cf. Ethics Pt. 1 Def.1; Prop V11; Prop V111, Schol.2.

22. Summa Theologica Pt.1

23. Symposium on Mechanical and Teleological Causation: Supplementary Proceedings of the Aristotelian Society 1935 (volXlV)

24. Ch.7

25. On the Notion of Caus: Mysticism and Logic (Allen & Unwin 1932)pp.195

26. For a full discussion of Hume's position see Ch.6

27. A defence of the assumption of universal sexplicability on the grounds of its utility is thus seen to be subject to a similar objection to Ramsey's defence of induction in general on the same basis, formulated in 'The Principles of Mathematics'

CHAPTER II.

ARISTOTLE'S CONCEPTION OF CAUSE.

(i) General Picture.

In discussing the term 'cause' as it has been used by philosophers, it is natural to begin with Aristotle. It is ~~true~~ true that the term was used by previous thinkers, but their usage has not had the influence on subsequent thought which Aristotle's views have had. Moreover, Aristotle is the first to attempt a comprehensive analysis of the conceptions involved.

Aristotle's philosophy may be regarded as a rationalisation of commonsense belief, in that it is a metaphysic which starts from, and seeks to explain, the basic assumptions of commonsense regarding experience. Being a metaphysic and an explanation of commonsense belief, however, it is far from identical with the views of the plain man. The latter are related to it rather as a simple musical theme to the complex set of variations based on it, in which that theme may, indeed, be hard to detect. Thus, for instance, like the man in the street, Aristotle postulates an universe of persistent entities exhibiting more or less persistent characteristics. But he makes assertions about these continuants and their characteristics, which would never have occurred to the plain man; and indeed would probably be denied, or at least considered very odd, by him.

The Aristotelian conception of 'cause' is no exception to this general rule. Aristotle adopts without question the

typical commonsense attitude which regards a 'cause' as invariably an explanation, though some of his 'causal assertions would seem very strange to the plain man. It was noted (1) that 'cause' might be defined as 'explanation' in the sense of logical ground, and hence a 'cause' be regarded as entailing its 'effect'. As will be seen, Aristotle, like the plain man does not so regard it, like him supposing it to explain its 'effect' as the latter's sine qua non. But this definition, since while it does not involve, neither does it exclude, a 'cause's entailing its 'effect', does not preclude the title's application to logical grounds among other things.

Aristotle's definition of 'cause' in terms of explanation is evidenced both by his practice of applying the title 'cause' of X' only to what he regards as explaining (or rather helping to explain) X's existence as its necessary condition, and by his explicit statements on the subject. In introducing his fourfold classification of 'causes' in the second book of the Physics he writes: '....men do not think they know a thing till they have grasped the "why" of it (which is to grasp its cause).' (2)

And again, later in the same book (3), he writes 'It is clear then that there are causes..... The number of them is the same as that of the things comprehended under the question "why".

These two quotations seem to indicate that not only does Aristotle regard every 'cause' as an explanation, but that he likewise regards every explanation as entitled to the name 'cause'.

This is a view entailed by the unqualified definition of 'causation' in terms of dependence noted above (4) since what is explained by X is, in the same respect, dependent on. It is rejected, however, by many philosophers who regard 'causes' as explanations.

Yet it seems clear that Aristotle was not, in practice, prepared to accept the completely unqualified identification of 'cause' and explanation which satisfied Spinoza. For while he postulates a First Cause which is uncaused, he does not thereby intend to postulate the existence of something inexplicable. (5)

The fact that the fourfold classification of 'causes' in the Physics is explicitly designed as an analysis of the explanation of change, its discussion moreover, being concluded with the remark: 'This then perhaps exhausts the ways in which the term cause is used:', (6) might indeed suggest an intended definition of 'cause' as 'explanation of physical change'. But such a definition is as evidently incompatible with Aristotle's usage as is that in terms of 'explanation' without qualification. For he supposes 'final causes' explain activity in intelligent beings by being recognised as desirable to them. Thus, while in postulating such 'causes' his aim is generally to explain some physical change - e.g. A's going to war - clearly on his interpretation he explains something more in doing so. For he is also explaining thereby experience of the type we call consciously choosing or deciding; and, whatever relation this may bear to physical phenomena, such an experience is certainly not 'physical'

in any ordinary sence of the word. To call it so would be to disregard the very distinction which the terms 'physical' and non-physical' were designed to express; and hence, the bare assertion that, for Aristotle, 'cause' means 'explanation' of physical change', is either untrue or else states what would ordinarily be expressed by saying that for him 'cause' means 'explanation of change'.

But neither is the definition of 'cause' as explanation of change' consistent with Aristotle's usage. For he applies the term 'cause' to mathematical definitions (7) and describes a syllogism's premises as 'cause' of its conclusion (8) It is true that a syllogism's premises may be regarded as explaining change insofar as they lead anyone to accept its conclusion. It seems evident, however, from the occurrence of this usage in the exposition of his logical theory, (9) that it is the premises relation, not to the actual deduction, but to the deducibility of the conclusion which Aristotle has in mind when he describes the premises as 'cause' of the conclusion. The most that could be said relevant to change with regard to this relation is that the truth of the premises would thereby serve to explain why one, who did not, should accept the conclusion. But clearly this is not an explanation of change but only of its desirability; and would remain true whether or not a change of the type concerned were a practical possibility (i.e. whether or no anyone failed to accept the conclusion, and, while so failing, was capable of being persuaded to accept it by this con-

sideration). Similarly, if, like Aristotle, one regards a 'cause of X' as something on which X depends, mathematical definitions may be considered 'causes' of change in that knowledge of them enables one to construct geometrical figures and perform calculations. But, his citing them as examples of 'formal causes', (10) together with his explicit denial that they are 'causes' involving motion, (11) evidences that in calling them 'causes' Aristotle is regarding them, not as conditions of calculations or of the production of mathematical figures, but as conditions of the nature of such figures given that these exist. (12)

Furthermore, even in the realm of physics Aristotle regards 'causes' of all the four main types he lists, as capable of contributing to the explanation of permanence as well as change. For, as indeed he recognises, in regarding them as explaining the coming to be of persistent entities he is, in effect, viewing them as conditions of their existence; that is to say, as conditions of 'effects' which, he supposes generally endure through a period of time.

There is, however, no need to regard the exposition of causal theory in the Physics as a definition of 'cause' as explanation of either change in general or physical change. There is no reason why one adopting a wider definition of 'cause' should not, on occasion, explicitly restrict himself to discussing 'causation' only insofar as he regards it as constituting the explanation of either change in general, or physical change in

particular. And clearly the latter restriction is demanded in a purely physical discussion if the terms 'cause' and 'causation' appear in it at all.

The form of the paragraph introducing the causal exposition in the Physics indicates that this was Aristotle's avowed position. For first he asserts that to know a thing is to understand its explanation, which is to say its 'cause'; and then he goes on to say: 'So clearly we too must do this as regards both coming to be and passing away, and every kind of physical change'. Nor need Aristotle's claim to exhaustiveness at the end of this account be understood as claiming more than its adequacy as an analysis of the explanation of physical change, or its dealing with all the explanations of physical change ordinarily offered.

The only definition of 'cause' in terms of explanation entirely consistent with Aristotle's usage, is that which allows the application of the term 'cause' to every existent in which is to be found, partially or fully, the explanation of something which is distinct from itself. This is a far wider definition than would be accepted by many philosophers regarding 'causes' as 'explanations'; many of these would, for instance, refuse the title 'cause' to the premises of a syllogism, mathematical definitions, and Aristotelian forms in general.

W. D. Ross has remarked (13) that Aristotle applies the title 'cause' to 'causal conditions' rather than to 'causes' in the

modern sense of the word. To single out one or more factors from a total situation as 'cause' of that thought dependent on it, is not peculiar to Aristotle. The plain man has been seen to do this constantly; and this is no less true of most philosophers, whether they make this explicit or, like Mill, define 'cause' as 'the sum total of the conditions positive and negative taken together; the whole of the contingencies of every description which, being realised the consequent invariably follows'. (14) Thus, for instance in discussing 'causation' they cite such examples as 'Arsenic causes death', although they do not suppose the 'causes' they thus discuss, to be the only condition of the 'effects' they ascribe to them. Indeed, this practice is inevitable since it would often be impracticable, if not impossible, to enumerate all the conditions thought relevant to the existence of a given 'effect'. Further, as has been seen, the purpose and utility of a causal assertion, often lies precisely in its singling out one among many postulated conditions either as being particularly relevant to a given 'effect' or for some other reason. Where Aristotle differs from most moder philosophers is in the types of condition he singles out as 'causes', in his refraining from attaching greater importance to one of the 'causal conditions' he recognises rather than another, and in his applying the title 'cause' to more than one 'causal condition'. These are very important distinctions, all closely interrelated, which will be discussed fully ~~in the~~ below. (15)

Since it is useful to distinguish certain among the conditions on which an 'effect' is supposed to dpend, and enumerating all relevant conditions is inconvenient if not impossible, the application of the title 'cause' to a factor within a total explanatory situation seems clearly reasonable. But, if confusion is to be avoided, a philosopher adopting this usage should make this clear in course of an analysis of 'causation'. And in this respect Aristotle is open to criticism; since while the 'causes' he enumerates cannot be supposed to include every type of condition on which an 'effect' may be thought to depend, not only does he fail to note this, but in fact explicitly denies it. Thus, as has been seen, having asserted the number of 'causes' to be 'the same as that of the things comprehended under the question "why"', he states these to be 'form', agent, end and 'matter', concluding 'The causes therefore are these and so many in number'; while a careful consideration of any of the 'effects' discussed by Aristotle reveals that (if it is explicable) factors of types additional to these four must be supposed relevant to its explanation. If, for instance a statue's existence is held to depend on the activity of a sculptor with his tools, it is reasonable to suppose that it would not exist unless oxygen had been present at the time of its making, and some tools had been kept sharp and free from rust; yet neither of these conditions can be identified with any of Aristotle's four 'causes'. The presence of air can be regarded neither as the maker of the statue, that from which it is made, the end which its making is intended to fulfil, nor the

character whose possession makes a statue what it is. (The role Aristotle ascribes to each of his four 'causes' will be fully discussed below (16) Neither can the maintenance of the tools in good repair be identified with any of these. It seems clear that by an 'efficient cause' Aristotle meant an agent (or agent and his instruments) of a specified character (or characters) adapted to producing the 'effect' in question; but even though it be granted that for Aristotle his tools' sharpness and freedom from rust is intrinsic to the 'efficient causality' of a sculptor, their being sharp and unrusted is clearly distinct from their being kept in a dry place and being regularly sharpened, which latter are indispensable to, but not part of, that 'causality' as Aristotle conceived it.

(ii) Form and Matter.

The conceptions of 'form' and 'matter' are basic to Aristotle's analysis of phenomena, and hence to his treatment of 'causation' since to him this is exemplified among phenomena. These notions, therefore, demand discussion before a detailed examination of his 'causal' analysis is undertaken.

Aristotle, as his disciple, inherited Plato's concern to give an account of specific differentiation; but, at the same time, found ~~that~~ the Platonic treatment of it unsatisfactory. Plato's doctrine of the 'forms laid up in heaven' had served to direct attention to the distinction between a common or shareable characteristic and its particular exemplifications, and hence to the need of abstraction in recognising the universality of such characteristics. But its ascription of independent existence to specific characters seemed to Aristotle, not without justification, to reveal a complete misunderstanding of the nature and role of universals. (17) And it was to remedy this defect that he formulated his own theory, which regarded 'form' and 'matter' (or characterisation and that characterised) as correlative constituents of continuants. (18)

To most people today, whether philosophers or no, the Aristotelian terms 'form' and 'matter' immediately suggest something obscure and unrelated to everyday experience. There are four reasons for this. (a) Philosophers have ceased to formulate their thought in Aristotle's terminology and hence this has come to have for them the purely antiquarian interest of Egyptian

hieroglyphics and Mespotamian cuneiform. (b) In the hands of the later Scholastics, Aristotle's language became very much of a technical jargon, serving to formulate arid and useless discussions which were little more than verbal manipulations. (19) In this situation discarding it became a prerequisite for substituting real thought for verbal juggling; and, as a result, the intellectual heirs of the thinkers who rejected it for this reason, have come to identify Aristotelian terminology with arid and purely verbal discussion. (c) The philosophers who first discarded the language of Aristotle, together with most subsequent thinkers, could not have failed to do so anyway, since it was not adapted to frame the questions they wished to ask; hence the naturaly prejudice in favour of one's own interests made it easy to regard Aristotle's language as divorced from 'reality' and 'real' problems; (d) Aristotle himself developed the notions of 'form' and 'matter' in such a way that he could legitimately use the terms in contexts where they would not ordinarily appear, and, indeed, in which they are unintelligible unless one understands the development of Aristotelian thought.

If, however, one starts by considering neither the fruitless discussions of his lesser disciples, nor Aristotle's own development of the notions; but rather their origin, it becomes apparent that in distinguishing 'form' and 'matter' he is but analysing a distinction recognisable readily enough in an examination of the commonsense view of the universe. One has only to consider the commonsense conception of any physical object to see that this is so.

When the plain man speaks of a chair he is intending to refer to a persistent entity. Moreover he supposes this entity to be composed of some material (or materials); e.g. he may suppose a house to be composed of bricks, or a jar to be composed of baked clay. And he will contrast this with other such entities by supposing it to be composed of materials other than those of which they are made. Thus if I ask him what is the difference between a gas-stove and a carpet he will, among the differences he lists, assert that while the former is made of metal the latter is not, being instead of wool. Very often chairs are, on this interpretation, made of wood; so I shall, for my example, discuss a wooden chair. Now it is at once apparent that, though the man in the street will contrast a wooden chair with other physical objects on the ground that these are not made of wood, he does not suppose 'This is a chair' and 'This is made of wood' to be synonymous. He is prepared to say 'This is made of wood' in contexts in which he would refuse to say 'This is a chair'. Moreover there are occasions on which he would be prepared to say 'This is a chair' ~~on which~~ when he would refuse to assert 'This is made of wood'. He therefore evidently has a criterion for distinguishing 'chairs' from other objects, which is independent of the material of which he supposes them to be made; and this criterion is not far to seek. For he applies the term 'chair' to those wooden objects only, which possess a given basic structure; and he is, moreover, prepared to apply it to an object he supposes to be of any other material if he is

assured that this also possesses that structure. He is not too rigid in defining this criterion: he is prepared to apply the name 'chair' to objects differing considerably in size and shape. But these all possess some basic structural and functional features: e.g. he would not apply the term to a seat lacking both back and arms, nor to one long enough to seat several adults. But what is this practice of distinguishing the structure of objects from the material of which they are made, but that of distinguishing what Aristotle calls 'form' and 'matter' respectively. The frequency of bowls, statues etc. among his examples, and his use of roundness and bronze as examples of 'form' and 'matter' in describing coming to be (in order to prove the important thesis that 'form' is not produced), (20) leaves no doubt that he first derived the notions from the consideration of this distinction within material objects.

Undeniably, the terms 'form' and 'matter' came to mean more to Ariztotle than 'spatial structure' (or even 'characteristic features of spatial structure'), and 'physical material'. But there seems no doubt both that the essence of the notions as he understood them is exemplified in the material constituents and structure attributed to physical objects by commonsense, and that the conclusions concerning them which he reached are derivable from analysis of these.

Thus he speaks of the 'form' of a musical relation; (21) and although he undoubtedly attributes this to vibrations occurring in space, it cannot itself be said to have shape nor, in consequence,

features of spatial structure, as a chair or table may be said to possess them. But it is not difficult to see how he passed from applying the term 'form' to shape and features of spatial structure to its application to musical relations. The 'form' of the bronze sphere which he postulates (22) is that which makes it what it is, its essence; and from his explicit identification of 'form' and 'essence' in the same paragraph, there is no doubt that in describing the proportion of 2.1 as 'form' of the octave he is regarding the former as the form of the latter relation in the sense of its essence. Now it has been seen that we are prepared to apply the name 'chair' to objects which agree only in sharing certain basic features of spatial structure. It thus appears that these are regarded as essential to anything being an object of the type to which we have decided to apply that name. That is to say they are regarded as making a chair what it is.

The definition of 'form' as 'nature' or 'essence' in the Aristotelian sense of that in virtue of which a continuant is of a specific type, that which makes us say 'This is an X', is thus not only consistent with the usage which applies the term 'form' to a chair's distinctive structural features; but is indeed naturally suggested by analysis of their relation to our calling it a chair, when they are regarded as an instance of 'form'. But once 'form' is so defined, then clearly one may legitimately speak of the 'form' of anything having a specific nature.

Similarly, the Aristotelian definition of 'matter' as 'that characterised by a specific nature', is both consistent with, and

suggested by, the role of material constituents in constituting an object of a given type by being characterised by certain structural features. And once so defined, the term may be applied to anything characterised by a specific nature, whether consisting of physical matter or no.

After my account of his purpose in formulating the conceptions of 'form' and 'matter', it should be unnecessary to stress that for Aristotle 'form' is specific and not individual nature. At the same time it must be admitted that his definition of 'soul' as 'form of the body' (23) is inclined to suggest the contrary, particularly to thinkers of the Christian era (in which the notion of 'souls' as essentially individual to each person has become predominant). But there is no doubt that this would be inconsistent with both his explicit definitions and his usage elsewhere. And it cannot be denied that his discussion of the 'soul' is concerned principally with the characteristic natures of the three basic types of organism, not with the questions of individual consciousness, responsibility, and surival, with which a discussion of this title has come to be associated since the spread of Christianity; which indicates that for Aristotle its 'soul' is an organism's specific nature.

It must be admitted, however, that in its application to man, Aristotle's definition of 'soul' as 'form of the body' is not very satisfactory if, as it appears, he intends thereby to identify it with a body's specific nature. For he attributes to the rational soul he ascribes to man, properties he explicitly asserts to be essentially independent of the body. (24) It would be more

consistent to apply the terms 'form of man' and 'form of the human body' respectively to the specific nature he attributes to the psycho-physical compound which (for Aristotle) is man, and to that of the human body. The associations of the term 'soul' make it inevitably misleading in such a context. Aristotle's use of it thus, seems to indicate that, while condemning Plato's doctrine of universals, he could not completely divest himself of the Platonic habit of ignoring the essential relativity of their role.

Even more important than Aristotle's identification of 'form' and 'essence' is his identification of 'form' with 'actuality', and of 'matter' with 'potentiality'. (25) This is an identification particularly significant in his treatment of 'causality'. Again it is an identification easily understood once his conception of 'form' and 'matter' is grasped; and one readily derived from consideration of the relation between structural features and material constituents within a physical object. On the Aristotelian analysis, a physical object exists, or is actual, only when some material exhibits some specific character. And it is further evident that a material, when exhibiting no structure other than that in virtue of which it is capable of becoming any one of a number of objects which it is not yet; ~~in other words~~, ~~it~~ is potentially many things. Thus wood, unfashioned, is potentially a chair (among other things) while, when it is given a certain specific structure this potentiality is actualised in it.

An inevitable result of the identification of 'matter' with 'potentiality' is the conception of 'potentiality' as essentially passive (though Aristotle does occasionally use the term in its active sense), and hence as evidence of helplessness and incapacity. The term has not always been so interpreted: sometimes when it is said that A is potentially this, or capable of that, what is intended is that A can become this, or do that, by its own activity or at least through its own inherently natural development. Thus for Leibniz 'potentiality' is essentially 'tendency to develop'. (26) But when 'potentiality' is identified with 'matter' in the Aristotelian sense this is impossible. For marble does not by itself become a statue, nor silver a bowl; nor are the potentialities in the ovum realised by its own inherent tendencies alone: and these to Aristotle are typlical examples of 'matter'. Furthermore, since this identification means regarding 'matter' as essentially lacking some fulfilment in the absence of 'form', it also leads inevitably to the view that 'matter' is less perfect than 'form'.

It was seen (27) that Aristotle was dissatisfied with the Platonic doctrine of universals precisely because it postulates the existence of specific forms independent of anything characterised by them; and that the Aristotelian doctrine of 'form' and 'matter' was avowedly designed to remedy this defect. However, when, having enumerated the possible definitions of substance as 'matter', 'form', and the compound of 'matter' and 'form', (28) he insists on the existence of at least one substance independent of all 'matter'; (29) he appears to be retracting this position by postulating the

existence of a 'form' independently of any 'matter'. And this conclusion is supported by his applying to such an existent the terms 'actuality' and 'essence', (30) which elsewhere he treats as synonyms of 'form'; and by his arguing that because such a substance is eternal it can contain no 'matter' and is therefore 'actuality' (which might with justice be interpreted as arguing that it is 'actuality' because 'pure form'). (31) It is not surprising, therefore, that he should have been accused of inconsistency on this score.

I hope to show that, while his postulation of a 'matterless' substance is comprehensible, and indeed inevitable, given two of his premises; Aristotle would be guilty of both verbal contradiction and intellectual inconsistency in applying the term 'form' to such a substance.

The two premises which, in conjunction, demand the postulation of a 'matterless' entity, are (a) the essential passivity of 'matter', and (b) the non-existence of the inexplicable. (Though Aristotle nowhere makes the latter explicit, it is implicit in much he writes: for example his arguments against an infinite 'causal' regress and in favour of a prime mover (32).

If nothing is inexplicable and something exists, and if that which explains X is that on which it depends, then there must be at least one existent the explanation of whose existence lies in itself. For if there never existed anything self-explanatory; then either there is (or has been) something inexplicable, or else there has been an infinite number of existents the one explaining

the other serially. The first of these alternatives is evidently inconsistent with the non-existence of the inexplicable, and the latter I shall show to be no less so, given the Aristotelian conception of 'explanation'.

It was seen (33) above that as it is humanly impossible to enumerate all the conditions one may reasonably suppose relevant to any 'effect', for practical purposes we ordinarily apply the term 'explanation' to part only of those conditions. Thus I may say that a faulty valve 'explains' my radio's eccentric behavior, although I know there are strong grounds for supposing many other factors besides the conditions of the valves, to be relevant to a radio's behavior at any time so that it would be reasonable to think they contribute to its explanation. It is a similarly imprecise but convenient shorthand for Aristotle to single out that on which X immediately depends as its 'explanation'.

If X's explanation is defined as that which entails X, then given a set of conditions which does so, X can be said to be explained irrespective of the possibility of explaining any of these entailing conditions in their turn. But if, like Aristotle, one regard X's explanation as that on which X depends whether by entailment or no, this is not so. For if X depends on Y, it depends on whatever Y depends upon. If therefore Y depends neither on itself, nor on anything else and so is inexplicable, X which depends on it, is likewise inexplicable. Thus if 'explanation' be defined as entailment, and his parents' union entailed A's existence, the latter is explicable even though the parents' existence is not. But if, like Aristotle, one regard the

explanation of A's existence as that on which it depends; then though his parents' union entailed his existence, one cannot regard the latter as explicable if so much as one of his distant ancestors was produced neither by a natural process (either organic or inorganic), nor by the action of a rational being, while at the same time not being such that his existence depended on his own nature alone.

That it excludes the explanation of its antecedents from an organism's explanation, indeed, shows that the definition of 'explanation' in terms of entailment fails to express the general conception of 'explanation' as answering the questions 'why?' and 'how?'. For the dependence of its parents on their progenitors, and these on theirs, and so on through its ancestry, when known, certainly contributes to our understanding of how an organism came to exist, if this is to be understood at all.

Now in an infinite series, whose members were explained, each by its predecessor, there would be no point at which everything on which any one of its members was dependent, was explained in the Aristotelian sense. For there would be no point in such a series from which it would not be necessary to regress in order to reach that on which one of its subsequent members directly depended. Hence on the Aristotelian conception of explanation, none of its members would really be explained at all (34). If therefore, he was to be consistent, Aristotle had to postulate at least one existent, the explanation of whose existence lay itself.

He was, moreover, justified in refusing to regard as self-explanatory, the universe as a whole, which he thought a compound,

some at least of whose members were not self-explanatory. For no compound could be self-explanatory. A number of existents could not be self-explanatory as a group, though none of its members was so individually; for clearly the existence of a compound pre-supposes that of its elements. To suppose its explanation to lie in its elements, not as individuals but only as conjoined, is thus to suppose the explanation to be logically posterior to that which it explains: which is evidently self-contradictory. On the other hand, were the elements in a compound self-explanatory, the whole would exist in virtue of the individual character of each of its elements, which is to say its explanation would ~~like~~ lie, not in itself as such, but in its elements as individuals.

Since A is explained by B insofar as it is dependent on the latter; whatever is essentially imcomplete or unfulfilled in the absence of something else, cannot be self-explanatory. Therefore X cannot be self-explanatory if it contain one part which is incapable of completion or fulfilment in the absence of another; for, since the incomplete part cannot be self-explanatory, so neither can the whole to which it belongs. Thus if X contains two elements A and B, the former being self-explanatory and the latter depending on it for its fulfilment or completion, then it is A and A alone which is the self-explanatory existent required by Aristotle's premises. Since, therefore, he defines 'matter' as essentially unfulfilled in the absence of 'form', Aristotle cannot with consistency suppose a self-explanatory existent to

contain 'matter'. Nor would it be incomprehensible should he call such an one 'form', since for him 'form' is opposed to the incompleteness and dependence of 'matter', as that which confers on it fulfilment and actuality.

Although such usage would be comprehensible, however, it would not be justified since it would be seriously misleading and inconsistent. And this for three reasons. 1). Aristotle would be guilty of an evident verbal contradiction in postulating a 'matterless form' at one point, while denying the possibility of such an one, at another. 2) Not only did he introduce the terms 'form' and 'matter' as correlative, but the correlation he designed them to express is such that nothing to which one of them is applicable in this sense, can exist in isolation from anything to which the other is so applicable. It is possible neither for a specific nature to exist in the absence of anything it characterises, nor for something to exist lacking any specific nature at all. Hence for him to apply the term 'form' to a 'matterless' substance, is not merely to deny an extrinsic connection elsewhere postulated, but to use at least one of the terms 'form' and 'matter', in a sense intrinsically different from that which it was originally designed to express. In doing so he would be in the position of one who not only affirms at one point that 'swans' are mortal, denying it at another; but who, having adopted the term 'swan' solely to in order to designate organisms, suddently applies it to inorganic matter. 3) Aristotle applies the term 'form' to nothing, apart from 'matterless' substance, which he does not

regard as a specific nature; nor does he anywhere define it in any terms other than 'specific nature' unless supposing them to be synonymous with, or include, this. To use it as other than correlative, thus implying its definition in some terms other than, and excluding, 'specific nature'; is thus inconsistent with both his explicit definitions and his usage in all other contexts.

The truth of the matter is that, in the sense in which he normally uses them, neither 'matter' nor 'form' are terms which could be appropriately applied to a self-explanatory existent. It has just been seen that, in this sense, neither applies to anything which can exist in complete isolation from anything to which the other is applicable; and since it has also been found that a self-explanatory existent must be simple, (35) such an one could not consist in a combination of both. It is true that the conjunction of 'form' and 'matter' is not like most compounds which we discuss, whose elements may all exist separately. Yet since 'form' and 'matter' are separately distinguishable elements within an existent, the latter is, in virtue of containing them, complex. In a self-explanatory existent, therefore, character and that characteriesed would have to be somehow identical so that the terms 'form' and 'matter', as ordinarily understood by Aristotle, could not significantly be applied to it. Clarity, therefore, demanded that in postulating and discussing such an existent, Aristotle should forsake the language of 'form' and 'matter' in favour of less misleading terminology.

In justice to Aristotle, it must be admitted that he does not himself apply the term 'form' to a self-explanatory existent. But on the other hand it cannot be denied that, while such an application is strongly suggested by his applying to such an one the terms 'essence' and 'actuality' (elsewhere invariably regarded as synonyms of 'form'), his describing it as a 'final cause' (36) while elsewhere regarding 'causes' of the latter types as in a sense identified with 'formal causes' (37)—which is to say 'forms'; and his threefold classification of substances; he makes no attempt to counteract this suggestion. He says neither that 'essence' and 'actuality' are here not to be identified with 'form'; nor that here 'formal' and 'final cause' cannot be identified; nor yet that there is an application of the term 'substance' additional to those enumerated previously.

In places Aristotle appears to be guilty of the opposite contradiction to that involved in postulating 'pure form'. For he speaks of a 'prime' or ultimate 'matter' or pure potentiality, to assert the existence of which would be an evident contradiction in terms; such formless 'matter' moreover would be completely indeterminate and hence inconceivable. There seems no need, however, to suppose that Aristotle meant to affirm the existence of unformed 'matter'. When he asserts that 'matter' is prior to, because presupposed by, change (38) he may well mean, not that an unformed 'matter' existed antecedent to all change, but that there was never a time at which no determinate or 'formed matter' existed. And when he describes 'prime matter' as pure potentiality, he may well be intending merely to point out the essential

relativity of the 'matter' or potentiality which he ordinarily discusses. Indeed he may be wanting to emphasise the essential relativity of the term 'matter' by showing that to postulate the existence of 'pure matter' would be self-contradictory.

Aristotle's account of the basic constituents of physical objects confirms the view that he does not intend to postulate the existence of 'formless matter'. For he supposes fire, air, water, and earth, to be the four elements of which all physical objects are composed; and further maintains (39) that these basic elements come into existence one from another, explicitly denying that anyone of them ever comes to be from any more primitive substance. (40) Indeed he proceeds to deny that there is even any such substance, at least in the realm of the perceptible — (41) by which he means presumably that though one could abstract from perception sufficiently to know what one would be asserting in postulating the existence of 'formless matter', he could in fact meet nothing so describable. Again in denying the possibility of an infinite regress among 'causes', he points out, (42) not that an infinite regress among the constituents of physical objects is avoided by their all deriving from 'prime matter', but that it is avoided by their deriving one from another. And yet again, in discussing growth, Aristotle insists (43) that 'matter' is something which 'can never exist without quality and without form'.

(iii) The Four Causes.

(a) Preliminary Summary of Aristotle's Doctrine.

It has been seen that Aristotle supposes 'causes' to be divided into four main types. These he lists in both the Physics and the Metaphysics. (44) The accounts of this classification appearing in both works are essentially the same, that in the Metaphysics indeed, having rather the appearance of a summary of the corresponding chapter in the Physics. (45) Nor does Aristotle confine his doctrine of the 'four causes' to its formal exporition; his explanations are invariably couched in terms of it.

As is well-known, Aristotle distinguishes his four types of 'cause' by the titles 'formal', 'material', 'efficient', and 'final'. The 'formal' and 'material causes' of X are simply its 'form' and 'matter' respectively: that is to say, the specific character in virtue of which it is of a given type, and that in it whose exhibition of that character constitutes the existence of such an one. Aristotle cites as examples of 'formal causes', mathematical definitions (46) i.e. the characters in virtue of which mathematical figures are as they are; the proportion of 2:1 in virtue of which the octave is such; (47) and the parts of a definition i.e. that in virtue of which a definition is as it is. (48) And he speaks of its spherical shape as the 'form' or 'essence' of a material sphere (49) which, according to his explicit definition, (50) is synonymous with calling its shape its 'formal cause'. As examples of 'material causes' he cites the bronze of which a statue is made and the silver of which a bowl or saucer is composed. (51) An 'efficient cause'

is a continuant whose history includes an event or events constituting a necessary condition of an 'effect's' coming into being: Aristotle offers adviser and father as examples. (52) And a 'final cause' is that for the sake of which, or that to attain which, something exists or occurs: in illustration Aristotle cites health as a 'final cause' of exercise, (53) the attainment of power as a 'final cause' of going to war. (54)

To Aristotle these 'causes' are not simply indispensable to their 'effects', but are related as the essential constituents of any 'causal process. For in his view change consists in the reception of a 'form' or character by 'matter' through the activity of an 'efficient cause' or continuant, which latter both before and after the transformation is other than the piece of matter thus receiving the 'form'. And all change is directed to the attainment of some end which is its 'final cause'. He is thus, in effect' assimilating all change to the production of a statue as conceived by commonsense.

In this way he possesses a criterion by which he could, if he would, distinguish 'efficient causes' from any other continuants an event (or events) in whose history constitute a necessary condition of any given 'effect'.

(b) Some major differences between common modern philosophical usage and that exemplified in Aristotle's formulation and application of his doctrine of the 'four causes'.

As has been indicated, the modern British philosopher ordinarily supposes either that it is certain, or that it is probable, that any 'cause' properly so called is related to its 'effect' according to a

law of regular corrleation such as is sought and formulated by the scientist. Basically there are four possible views of the experienced uniformities on which the postulation of such laws rests. It may be held: (a) that they rest on intrinsic connections between the factors so correlated; (b) that they rest on a necessity extrinsic to those factors by themselves; (c) that they exemplify a purely de facto universal uniformity; (d) that there can be no certainty that they hold except where and when their doing so is directly observed. Those holding the latter view may suppose the experience of an uniformity renders its universality probable, while those denying this may yet suppose that it renders it more probable than not that it will obtain in any given context of a certain type. Whether they admit it explicitly or not those philosophers who deny certain universality to these uniformities, assume this latter in practice. In general the 'causal' conceptions of one defining 'cause' in terms of law reflects the view of 'established uniformities' which he adopts.

Although the definition of 'causation' in terms of 'law' allows these differences of causal theory, it demands a certain uniformity of usage. For whatever conception of 'law' (in the scientific sense) may be held, it is generally agreed that nothing shall be so called unless it asserts an observed uniformity. Thus, for most modern British philosophers (who, as was seen, in asserting a connection between 'cause' and 'effect' are usually stating correlations between types rather than connections between individuals), two given types of existent A and B may be said to be mutually

related as 'cause' and 'effect' respectively only if: (a) whenever an A is known to have been observed under conditions of a given type, say C, observations having been made that must have discovered anything standing in a given type of relation, say R, to A, a B has always been found standing to it in that relation; while (b) there is not known to have been convincing evidence for the existence of an A under C conditions when equally, or more, convincing evidence that no B stands to it in an R relation, is known to have existed. It is true that Russell in his essay 'On the Notion of Cause', (55) defines the term 'cause' as applicable to a type of event generally but not invariably followed by a given type of 'effect'. But this definition is not necessarily inconsistent with that offered above; and indeed whatever the inadequacy of his explicit definitions and analyses may suggest, it seems unreasonable to suppose that any philosopher does really believe in an unconditionally invariable sequence between 'cause' and 'effect'. The reasons Russell offers for denying invariable sequence between 'cause' and 'effect' are the possibility of any 'causal sequence' being intercepted, (56) and the complexity of the factors on which any 'effect' can be supposed to depend; (57) and as has been seen neither is inconsistent with a regular correlation between 'cause' and 'effect', and indeed it seems indubitable that both factors are taken into account, at least implicitly in a modern assertion of 'causal law'. Moreover, while most modern philosophers would agree with Russell that any 'causal' situation, when precisely analysed, may reasonably be thought unique, they suppose it possible to isolate within it certain types of factors

which may be found to exhibit a regular correlation with phenomena like the 'effect' ascribed to them; and indeed Russell's own acceptance (in the same paper) of the admissibility of postulating laws of functional relation reveals him as admitting precisely the same principle. Therefore, even though Russell, at the time of writing 'On the Notion of Cause' might have repudiated the definition I outlined above, his usage, in this paper, was not inconsistent with it, nor did his analysis of the notion of cause reveal it to be unjustifiable.

Although the modern British philosopher normally refuses to apply the titles 'cause' and 'effect' save under the conditions I have outlined above, their fulfilment does not suffice to make him do so. Thus there is as strong evidence that whenever air is present, certain other conditions being fulfilled, a hare comes into existence, as there is for any 'connection between 'cause' and 'effect' asserted by the modern British philospher; but it is no more customary to call air 'cause' of the coming into existence of a hare today, than it was among Aristotle's contemporaries. For the modern British philosopher does not apply the title 'cause of A', to any one among a set of conditions which he supposes to have been regularly correlated with A. Instead he applies it either to that, or those, among them which distinguish such a set from one to which that correlation cannot be ascribed; or to those which consist in the introduction of a factor into a set of conditions, thereby apparently initiating the coming into existence of the 'effect' regularly correlated with the total situation consisting in the initiating factor together with the set of conditions into which it was introduced. Many philosophers

subsequent to Hume, indeed, confine the title 'cause' to the latter type of events, or event complexes.

Since the modern British philospher ordinarily thinks of 'causation' in terms of humanly experienceable correlations, and our experience is temporal; to him 'cause' and 'effect' are always temporally related. To some modern British philosopphers a 'cause' always precedes its 'effect' (or it is at least reasonable to suppose it has done so in the past); to others a 'cause' may either precede, or be simultaneous with, its 'effect'.

Normally, if anyone supposes an uniformity to have been experienced in the past, he expects it to continue to obtain in the future. And, indeed, it seems clear to me that under such circumstances it would be unreasonable not to expect this. (I shall further discuss and defend this contention below, (58) where doing so will be more appropriate). But this is to say that if 'to infer' be defined as 'to reach with justification either a probable conclusion or one that is certain'; then if 'causation' is defined in terms of 'law', an 'effect' is always inferrible from its 'cause' no matter what interpretation of 'law' be adopted. But whether or no 'effects' be regarded as inferrible from their 'causes', since on this definition 'causes' naturally provoke expectation of their 'effects' and are by many philosophers regarded as a just basis of inference to them; when 'causation' is defined in terms of 'law', 'causal' theories are inevitably theories concerning the justification of inference from 'cause' to 'effect'.

Aristotle's usage is fundamentally different from that of most modern British philosophers, in that it is inconsistent with the definition of 'causation' in terms of 'law'. This, however, does not reflect a denial either that experience has been found to exhibit certain uniformities, or that it is reasonable to suppose a given specific correlation to be exhibited when any phenomenon of a given type exists under certain circumstances. Indeed, he often applies the term 'cause' to a type of existent with which he supposes a given species of 'effect to be constantly correlated when certain conditions are fulfilled. Thus he writes in general of a father as 'cause' of his offspring being convinced that the production of offspring similar to themselves always follows the union of male and female if appropriate conditions prevail at the time of copulation and during the period of gestation. And, similarly, he calls bronze 'cause' of a statue, supposing that whenever bronze exists and certain conditions (e.g. its being cast efficiently in a certain type of mould etc.) obtain, it is transformed into a statue. But he does not use the terms 'cause' and 'effect' in order to assert such a correlation. And this is simply because while (as has been noted) (59) he regards the term 'cause of A' applicable to B only if A depends on B; he does not suppose that in order to depend on B, A must always stand in a given relation to it; nor even that such a dependence cannot be postulated even with probability, unless there is not known to have been convincing evidence for both the existence of a B, and there being no A standing in a given relation to it when certain conditions have obtained. Thus he supposes that there are events (namely voluntary

actions) which are impossible in the absence of certain conditions and therefore, in his sense, 'caused', though these conditions need not always be correlated with any such action.

On the other hand, a 'formal cause' as originally and ordinarily conceived by Aristotle, is something indispensable to its 'effect' which is not related to it in accordance with a law of regular correlation on account of lack, not of uniformity, but of relation. For in the formulation of his 'causal' analysis and his most frequent use of the term, the title 'formal cause of A' is applicable to a specific character in virtue of its being exhibited by A thus making it what it is. 'Matter' and 'form' are related as that characterised, and that characterising it; but although normally there is a distinction between a specific character and an existent exemplifying that character (e.g. the character of being a chair is not itself a chair), yet it is not possible, even in thought, to distinguish any existent from its specific character so as to recognise a relation between them. For once eliminate from a chair the character of being a chair, and it is a chair no longer; and similarly to eliminate the conception of its being a chair from the thought of a chair, is to cease to think of a chair. In other words, once take away a chair's specific character, even in thought, and there remains no chair to which it could be related; and, indeed, to take its character from an actual chair is to lose both chair and character, since clearly A's character exists only so long as it is exemplified in A.

Moreover, it is clear that no one who wished to assert a regular correlation in positing a 'causal connection' would be likely to apply the title 'cause' to material and agents in general, even though he supposed there to be none not invariably and uniformly correlated with its Aristotelian 'effect' under given conditions. For there are many materials and agents of which it cannot be denied that they have in the past been found correlated with many different things, although it is reasonable to suppose that whenever one of them has been observed and there has been good evidence that one specific set of conditions has been fulfilled, it has always been correlated in the same way with the same type of thing. Thus, for instance, it is reasonable to suppose that whenever bronze has been known to exist in the past, certain conditions having been fulfilled, it has been transformed into a statue; while it is equally reasonable to suppose that when it has been observed and there has been reason to ~~suppose~~ think another set of conditions to have been fulfilled, it has become a bowl; and it has thus appeared to be regularly correlated with objects of many other different types - brooches, bracelets, vases, shields, swords, daggers, lamps, etc. And again, it is reasonable to suppose that, whenever a tomcat has been observed and there has been reason to suppose one set of conditions to have obtained, kittens have come into existence; while it is equally reasonable to suppose that, whenever a tomcat has been observed and there have been good grounds for supposing another set of conditions to have been fulfilled, a mouse has died; and similar regular correlations seem to have obtained between tomcats and the

disappearance of milk, the emission of purring sounds, etc. But it is clearly most reasonable, natural, and convenient in asserting or describing a correlation, to lay primary emphasis on its distinctive features.

It is obviously most rational to do this, since it is in the interest of clarity to lay primary emphasis on that which distinguishes the correlation one is formulating or postulating. It is clearly natural to do so, since we most readily connect A with B in thought when we have both frequently found it related to B and have never found it related to anything else. And it is most convenient to do so. For if a correlation is stated in the form 'A is correlated with B given C', when A indicates something correlated with other things under different conditions, it is necessary to enumerate some of the additional factors in this specific correlation in order to distinguish it from the others in which A is found; whereas when a correlation is stated in the form 'X is correlated with Y given Z' when X indicates a factor peculiar to this correlation, it is not ordinarily necessary to enumerate the factors indicated by Z, and indeed mention of them may often be omitted completely without ambiguity. The same considerations prevent any philosopher who regards 'causes' ~~are~~ as primarily something from which their 'effects' are inferrible, from applying the title 'cause' to material and agents in general.

In addition to these fundamental differences between Aristotle's 'four causes' and anything to which the modern British philosopher is normally prepared to apply the term 'cause', none of the 'four causes'

is an event—let alone one that may be regarded as initiating the occurrence of its 'effect'. It is true that to some philosophers (e.g. Russell) a quantity of matter or an agent is simply a series of events; but they are not so regarded by Aristotle. And even if they had been, this would not render his application to them of the term 'cause' consistent with the usage of the modern philosopher who confines it to events; for clearly such a series of events is neither a single initiatory event, nor an initiatory event complex. And clearly neither specific characters, nor ends, can be regarded as events on any interpretation while the term 'event' is understood in its accustomed sense.

It is true that there is one context in which Aristotle does in effect treat the title 'cause' as applicable to events; but this usage occurs only in the formulation of his 'causal analysis,(60) and in addition does not coincide with any usage common among British philosophers today.

It has been seen that Aristotle applies the unqualified title 'efficient cause' to agents, that is to say to anything which he regards as a continuant in whose history occur events in virtue of which he regards something else as dependent on it as its maker or producer. Clearly when the title 'cause' is thus applied to agents, it is necessary to distinguish the events in virtue of which they are regarded as such, from the remainder of their histories, in order to make explicit the relation postulated between them and their 'effects'. In making this distinction, Aristotle uses the terms 'actual efficient cause', and 'potential efficient cause'; using the former to designate an agent when the connecting events are occurring,

and the latter to designate one at any other time; thus, in effect, he applies the title 'actual efficient cause' to events. In so using the title 'cause' however, not only is Aristotle treating it as applicable to series of events, rather than to a single event or event complex, but he is regarding it as applicable to series of events containing no member to which the modern British philosopher would normally apply the title 'cause'. Thus to Aristotle the 'actual efficient cause' of a house, is a builder while building it, (61) which is, in effect, to regard the title as applicable to the events constituting the building process. And the modern British philosopher would regard none of these as playing the initiatory role in virtue of which he applies the title 'cause' to events. Such a philosopher would suppose that if there is an initiatory event which may be properly called 'cause' of a house coming into existence, this must exist prior to the building process.

Clearly one conceiving 'causal connection' as do the majority of modern British philosophers, is not justified in adopting any of the Aristotelian applications of the term 'cause' discussed above. But this is not to say that Aristotle is not justified in adopting any or all of them. In order to judge whether he was or not, it is necessary to discover whether his adopting them is consistent with what he intends to assert in postulating a 'causal connection', and whether he is justified in this intention.

(c) The source of Aristotle's fourfold classification.

One cannot merely dismiss Aristotle's classification of 'causes' as fanciful or nonsensical, however queer it may seem to the modern

philosopher,. For no one talks or writes nonsense, if he can avoid it, when he wishes to be taken seriously; and philosophers always wish this. I shall therefore consider first what led Aristotle to make this classification; and then whether he was, or could have been, justified in so doing.

In order to discover what led Aristotle to make his classification, one must consider the contexts in which he applied explanation in terms of it. Most numerous among these are thos accounting for the products of generation and of artificial human making (e.g. the work of sculptor, silversmith, etc.)

If one considers artificial products and their explanation, it becomes evident that it is reasonable, and indeed a practical necessity, to explain their existence in term's of Aristotle's 'fourcauses'. It is clear, for instance, that a chair does not exist in the absence of a certain minimum quantity of wood, or other appropriate material or materials; and that it does not exist, though such material does, unless this latter exhibits a certain basic structure. Furthermore there is convincing evidence that chairs have not existed unless someone has gone through one of a finite number of action series. And, whatever be the correct account of 'voluntary action', there is further evidence that chairs have not come into existence unless someone has at some time had an experience describable (according to ordinary usage) either as 'intending to make a chair' or 'intending that a chair shall be made'; nor does the experience of intending seem to have occurred without a contemporary or previous regognition of the desirability of that

intended. (It is true that in postulating the 'final causation' of statues, bowls, etc. Aristotle assumes not only a regular correlation between intending A and recognising A to be desirable, but also the intrinsic indispensability of the latter to the former; but the regular correlation is at least essential to that which he asserts, and there seems little doubt that were it not for the evidence for that correlation Aristotle would not have framed his account of voluntary action).

Moreover, there is evidence that chairs, statues, etc. do not exist unless the role of at least three of Aristotle's 'causes' is known; and, indeed, there are circumstances under which they are at least thought (not unreasonably) unlikely to occur unless the indispensability of all four is known. Thus for centuries men wished for dirigible aircraft, but none existed until Langley (62) and the Wright brothers discovered both materials suitable to be made into such an object, and the structure which such an one would exhibit. Similarly, there was no efficient telephone until Bell discovered that given materials, ordered according to a specified design, constituted such an object. And a like story is known to be true of radio and television sets, cars, steamships, telescopes, cameras, and a host of other objects which are today commonplace. And the time and effort, spent (not to mention risks undertaken), by those with a practical interest in invention, in order to discover material and structure which, in conjunction, constitute an object of the type whose existence is aimed at, testifies to their belief in the indispensability of such knowledge to that end.

And there is evidence that no artificial object has existed, even given the above knowledge, in the absence of anyone supposing specified action attributable to a human being to be required before it can exist. Thus to take a simple example, thousands of small boys, when they come to learn carpentry know the nature of book-ends, stools, and tables, and that these may be made of wood; but it is only after they have also learned that specified action series may issue in their existence, that new book ends etc., start coming into existence correlatively with their activities. Knowledge of each of the factors involved in an object's 'efficient causation' (namely the type of activity indispensable to its coming into existence, and the species of agent to which this is attributable) is clearly inseparable from that of the other, since the function of each is described properly only with reference to the other.

Langley and the Wright brothers respectively, built the aeroplanes they conceived, wishing to do so for the satisfaction of the achievement. But if I wish an aircraft, chair, etc., to come into existence, being at the same time unable or unwilling to make it myself, I may well find my wish reamin unfilfilled unless I take into account the relevance of desire to see it fulfilled on the part of a person, or persons, capable of achieving this. Thus a manufacturer who fails to make conditions of employment sufficiently attractive finds himself unable to obtain sufficient labour or is faced ~~by~~ with strikes ~~from~~ by his employees. The statements of government spokesmen on the recruitment of labour for aircraft production,

for instance, has testified to their having found consideration of 'final causation' important in this context.

To those who deny Aristotle's conception of minds, physical objects, and the material constituents of the latter, as persistent entities, the foregoing paragraphs inevitably have a meaning different from that which they would have for Aristotle or the man in the street. But the rejection of this conception renders them no less significant or true. As ordinarily interpreted, an assertion that this is an object capable of flight because it is composed of certain materials in accordance with a specified design, or that this is an object incapable of flight because of the nature of its design or constituent materials, or both, says something true and explanatory about persistent entities. But this is not all. It has been seen (63) that, on the commonsense interpretation, such an assertion also says something about actual and possible sense experience. A philosopher may deny the truth of the assertion concerning persistent entities by denying the interpretation of experience it involves; but he cannot deny that about possible experience unless he is prepared to assert no more than he actually experiences. Furthermore, though interpreted solely as assertions concerning actual and possible experiences, statements referring to an object's material constituents are not synonymous with those referring to its design. For instance, so interpreted, the sentences 'This is an object incapable of flight on account of its design', and 'This is an object incapable of flight on account of the materials of which it is composed', express clearly distinguishable assertions

concerning actual and possible experiences. The former asserts among other things that no experience of the type we describe as 'seeing an aeroplane fly' is possible unless it is also possible to see or feel 'certain shaped surfaces in given relations one to another', or more precisely 'one or other of a finite series of differently shaped surfaces, in one or other of a finite series of mutual relations'. While the latter asserts that the experience of 'seeing a machine fly' is possible only if certain experiences of 'hardness and resistance' and given more precisely specifiable experiences of 'reactions of material (e.g. to stress and strain tests) are also obtainable.

It must, therefore, be admitted that on any interpretation of experience, Aristotle's 'four causes' are distinguishable factors relevant to the explanation of the existence of artificial products, factors moreover knowledge of three (and sometimes all) of which seems indispensable to their coming into existence (i.e. of the truth of the assertions about possible experience implied by sentences like 'A chair exists'). To say so much, however, is not to admit the Aristotelian explanation of other phenomena in terms of the 'four causes'. Nor does it involve adopting the Aristotelian use of the term 'cause' with regard to artificial production. It is, for instance, consistent with the refusal to apply the term to Aristotle's 'formal cause' on the ground that its 'effect' is not inferrible from it. And it is certainly not to assert that the Aristotelian account of artificial production should be acceptable on any view of experience. For the phenomenalist, though he must take into account what Aristotle and plain men regard as the

character and constituent materials of objects, can neither suppose the latter a persistent something, nor the former a character exemplified in this or anything else. He cannot therefore regard such production, like Aristotle, as essentially the conferring of a given character. Nor of course can he conceive the roles of 'efficient' and 'final cause' as does Aristotle.

Aristotle's treatment of the 'formal cause' in this context is, indeed, open to criticism even though artificial production be regarded as essentially the conferring of a specific character. For it is of great importance, for practical purposes as well as in the interest of clarity for its own sake, to distinguish a condition of A's existence, which is not also a condition of its coming into existence, from those that are. And this is a distinction which is obscured by Aristotle's treatment of the 'formal cause'. It was seen (64) that, in his explicit formulation of the fourfold classification, Aristotle defines a 'formal cause' as the character which makes anything an existent of a given specific nature: e.g. the character in virtue of which this marble is a statue. And it has been observed (65) that, as such, a 'formal cause' is inseparable from its 'effect'. But clearly, so conceived, A's 'formal cause' cannot be regarded as a condition of A's coming into existence, since a character can only be so regarded as 'formal cause' of A while A is actually existing. Yet in the Physics as has been seen (66) he presents the fourfold classification as an adequate analysis of the explanation of change, which suggests that the 'formal cause' is to be regarded as a condition of the coming into existence of its 'effect'.

Certainly he elsewhere (67) identifies 'formal' and 'efficient cause' maintaining that the agent produces his or its 'effect' in virtue of possessing the latter's form in itself. But, as will be argued below, (68) this is clearly a different use of the term 'formal cause' from that outlined in his definitions; and hence far from removing the inconsistency involved in the explicit formulation of his doctrine in the Physics, merely adds a further inconsistency to his usage.

Presumably, in postulating 'form' as one of the 'causes' of change, Aristotle is wishing to affirm it to be one of the essential factors in change in that all change consists in the imposition of some 'form' upon some matter'; but his explicit definition of 'formal cause' certainly does not make this clear. Nor is the imposition of a 'form' identifiable with that 'form' (e.g. giving wood the 'form of a chair' is not itself the 'form' or nature of a chair); so that it remains necessary to distinguish the condition of constituting an A which is its 'form', from the conditions of a change which consists in the giving of that 'form' to some 'matter'. And it is precisely this distinction which Aristotle fails to make explicit.

(d). The general application of the fourfold classification.

If, like W.E.Johnson (69) one holds that all change presupposes a persistent subject, then one must agree with Aristotle that all change consists in the conferring of a specific character. For, at the least, when a distinctive event occurs in the history of a continuant clearly the latter is describable in terms

inapplicable to it at any other time. And if 'people' and 'physical objects' are properly to be regarded as continuants then many events and event series are to be regarded as conferring on those continuants, characters persisting through a longer or shorter period. If, moreover, one holds with Aristotle both that nothing is inexplicable and that there is no quality or event which is not attributable to a continuant, then one must suppose every change dependent on a continuant analogous to Aristotle's 'efficient cause'. (Teleology, or the general application of explanation in terms of 'final causes', demands separate discussion; and will accordingly be considered below). (70)

If, as has been suggested, phenomenalism is false, then there are at least some changes which consist in the reception of a specific character; it seems unlikely, however, that in defining change, Aristotle was intending to give an account of some varying event series while admitting others to fall outside his theory. To justify his position, therefore, it is necessary to do more than show phenomenalism to be untenable; rather must it be shown that no succession of different events is possible unless its members are attributable to continuants: e.g. it would have to be shown that claps of thunder and lightning flashes, for instance, must be attributable to the histories of continuants. As commonly understood, 'change' presupposes something that changes: but clearly to defend Aristotle's position it is not enough to point this out. It is, indeed, difficult to avoid circularity in defending the interpretation of experience in terms of continuants,

since the words we use to describe it are generally defined in terms of that interpretation. Thus it seems clearly self-contradictory to speak of a quality existing independently of any continuant, since 'quality' is ordinarily defined as something qualifying, or attributable to something else. In discussing whether any experience can be interpreted other than in terms of continuants, one is asking not whether qualities can exist without qualifying, or parts of a history without being elements in a history (which would be clearly nonsensical), but whether experience is to be interpreted solely in terms of continuants or whether sense data or other existents may occur which neither persist through any change nor are either characteristics or effects, of any other existent.

Johnson argues (71) that every event must constitute part of a continuant's history since an event is only definable with reference to such a continuant, or rather to the potentialities of such an one. As an example he cites drinking ether, which is adequately defined only by reference to the 'causal properties' of ether. To this it might be countered that to say, correctly, that drinking ether is adequately describable only with reference to the 'potentialities of ether', need mean no more than that it is correct to describe an event as 'drinking ether' only when certain hypothetical assertions about experience are true; and similarly with the description of other events.

A little later Johnson argues that 'causation' presupposes the attribution of 'cause' and 'effect' events to continuants, on the ground that only so can one event be supposed to determine another. He offers physical and psychological evidence for his view. He

contends (72) in the first place, that 'the character, date, and location' of one movement can determine that of another only 'if the same material continuant is manifested in the two movements'. And again he avers (73) that, similarly, 'the character and date' of a sensation can only be supposed determinative of those of a thought process 'if, in the simplest case, the same psychical continuant is existentially manifested both in the sensation and the thought process'. The wording of these arguments is somewhat unhappy in that it suggests Johnson to be contending that only immanent causation is possible - a view which he certainly does not hold since he is careful (74) to distinguish transeunt and immanent causation, regarding them as correlative processes. The parenthetic 'in the simplest case' in the second argument must, therefore, be regarded as exemplifying a general intention of asserting the simplest hyposthesis consistent with the determination of one event by another, to be their joint attribution to one continuant.

There is no doubt that for Johnson, as for many others, an essential ground for postulating a 'causal' connection between events is always their attribution to continuants. Thus he supposes one movement to entail the prior or subsequent occurrence of another because he attributes it to a moving continuant, and holds continuants to move in a certain manner under given conditions. And similarly he supposes one psychological experience to depend on, or determine, another in virtue of laws governing the behaviour of persistent minds, and so on. For him, therefore, it is true that to deny the reference of an event to a continuant, is to sacrifice the ground for calling it

'cause' or 'effect'. But this is not universally true. There is no inherent contradiction in supposing that events not referable to continuants, might always occur consistently with the truth of certain sets of hypothetical assertions about experience. And were this so, the occurrence of one event could be said to depend on that of another. Moreoever were it unjustifiable to regard such regularities as universal, the available evidence might yet point to their always having obtained in the past; and were this so the occurrence of one event might still be justly inferred from that of another. If, therefore, 'causation' be defined in terms of de facto regularity in general, dependence, or inferribility, there is no inherent need for a 'cause' or 'effect' event to be attributed to any continuant. If, however, 'causation' is defined in terms of intrinsic connection the position is less simple. In the first place there could be no intrinsic connection between events not attributable to continuants, unless they were temporally continuous. For since such an event would contain nothing which existed prior to itself, were any two wholly successive, or wholly simultaneous, neither could contain anything in virtue of which either could be connected with any time other than that in which it actually existed. This would not ordinarily preclude the modern British philosopher from admitting the possibility of intrinsic 'causal' connection between such isolated events, or analogous existents, since most modern British philosophers suppose 'causal sequence' continuous. Again, if two events are continuous, at least one of them must have duration; but this, in its turn, does not preclude the ascription of continuity to isolated

events. For the refusal to attribute events to continuants need mean, not the unqualified denial of their persistence, but merely the denial of their persistence through change.

But although an intrinsic 'causal' connection between continuous isolated events, or analogous existents, may thus be admitted possible; we have no adequate ground for postulating such a connection between any given phenomena so conceived. If two phenomena are each regarded as neither containing, nor characterising, anything existing prior to itself; one can be said to determine, or be necessary to the other intrinsically, only if it either creates that other 'out of nothing' or enables it to come into existence 'out of nothing' respectively - i.e. is capable of rendering it either necessary or possible that whereas at one minute there is nothing from which A could develop or be formed by a process of any length, at a subsequent time A should exist. And whether or no a philosopher allows the possibility of either of these contingencies, he can hardly claim to understand how either can be achieved. Neither, therefore, could he claim to discover, by inspection, such a relation between phenomena regarded as thus isolated, since he would not know for what to look. And this ignorance would equally preclude him from seeing the character of any such phenomenon to entail, in itself, its so conditioning, or being conditioned by, another. Nor could he defend the ascription of such a relation to them on any of the grounds on which the belief in God's having originally created the universe 'out of nothing', has been defended. We have, for instance, no ground for ascribing to any transient phenomenon an overflowing goodness and love, prompting

it to create something apart from itself to be an additional object of its love and recipient of its goodness. Again, while if one allows everything to be explicable and deny the eternity of the physical universe, however conceived, one must hold that universe to have originally come into existence 'out of nothing' through the agency of a self-explanatory, and hence eternal, being; clearly one could use no such argument to defend the ascription of a like creative role to a transitory existent. Nor is there any inductive ground for postulating intrinsic 'causal' connection between phenomena, if these are not conceived in terms of continuants. It was seen (75) that when interpreted in terms of phenomenalism the 'causal laws' ordinarily asserted must be regarded as affirming the occurrence of experiences of a given type in a specific context when certain hypothetical assertions are true. And it is further undeniable that the available evidence contradicts the assertion of regular correlations between actual experiences independently of the truth of any hypothetical assertion. Thus, for instance, while the evidence indicates that the experience of 'turning on a certain switch' is always followed by an experience of illumination if certain hypothetical assertions are true; this sequence has failed to occur when there has been evidence inconsistent with the truth of hypotheses such as that if there occurs an experience describable as 'looking in a certain fuse box', there will be another describable as 'seeing a given wire intact'. And since the truth of a set of hypothetical assertions cannot be regarded as an actual existent or existents, phenomena or no; it follows that if phenomena are not

attributed to continuants there is no evidence of regular correlations holding simply between one existent or complex of existents, or its actual states or relations, and any other actual conditions. But the only inductive ground for supposing A such that it cannot exist in the absence of B, is evidence of the non-existence of A in the absence of B.

Since Aristotle clearly regarded an 'effect' as intrinscially dependent on its 'cause', he would not, therefore, have been justified in asserting specific 'causal' connection among phenomena had he not interpreted series of different events in terms of continuants and hence as exemplifying 'change' in the sense of the conferring of a character on something already existing.

Whether or no one agree with Aristotle that all successions of different events are properly analysable in terms of his 'four causes', it cannot justly be denied that for practical purposes it is inconvenient, and may indeed be positively misleading, to describe phenomena other than artifical production in terms of them. I shall confine myself to pointing out the inconvenience of so describing generation, since this is the subject of Aristotle's most frequent use of the fourfold analysis.

Very little thought is needed to show the inadequacy of his describing generation simply as the bestowal of a given specific 'form' or nature on 'matter'. For although an animal, like a chair or an aircraft, can be described as certain materials ordered in a specific manner; generation, unlike the making of a chair or a statue, cannot be described merely as a process whereby those

materials are ordered in that way. Rather would it have to be regarded as one which includes the production of most of the 'matter' eventually so ordered. To describe it in terms of the imposition of 'form' on 'matter' one would, for instance, have to say that it is a process in which the 'matter' which is some of the chemicals in the soil or some of the mother's food (as it is the generation of plant or animal respectively), receives the 'form' which renders it 'matter' adapted to become an organism of a given type; this in its turn receiving the 'form' which makes it such an organism. But even this would be a misleading oversimplification; for generation cannot be regarded simply as the consecutive conferring of two 'forms' i.e. the production of plant fibres or of flesh blood, bones, nerves and sinews, followed by their being formed into an organism of a given type. Rather must it be regarded as a process in which cells or minute pieces of 'matter' having a given 'form' increase in size by the addition of fresh 'matter', and in number by dividing as one worm becomes many; and the ever increasing cell-group exhibits first one structure and then another, until finally that characteristic of the complete organism is reached. Further, neither bone nor sinew is present in the embruo's original cell structure, but both are produced concomitantly with its growth and structural development. And, indeed, even when 'matter' exhibiting the characteristic structure of the organism generated can at length be said to exist, this still has to increase in size (in animals, both before and after birth). This means that, not only is more of the appropriate 'matter' produced and added to it; but that the materials added to, must continue to alter their mutual

correlations in order that with the additional 'matter', they may constitute the same structure as they previously did without it. One might indeed say that throughout the process of generation, 'forms' first different and then alike are being continuously conferred on 'matter', or rather on different collocations of 'matter'.

To speak, therefore, as Aristotle habitually does, of father or spermatazoon as simply conferring the 'form' of a given animal species on 'matter' within the mother, is thus a gross oversimplification (quite apart from the biological inaccuracy in his failure to realise that the father contributes some of the 'matter' of which the offspring is originally composed, and that ovum and spermatazoon, once conjoined, may be said (in the common parlance which he accepts) 'to act on one another'). Doubtless the whole generative process could be described in terms of events attributable to 'physical objects' (however these are conceived), on which the exhibition of specified 'forms' in corresponding 'matter' appears to depend; but it is equally certain that it must consist in a very long series of such events, the precise description of it in these terms being both long and complex (and thus very unlike that proffered by Aristotle). To describe generation correctly in these terms would, therefore, seem to be very inconvenient and, in all probability, a practical impossibility to the human intellect.

It seems probable that Aristotle failed to see the oversimplification of his account of generation because, though realizing the final structure of the generated organism to be reached only later, he regards conception—or fertilization—as conferring the species of the complete organism on that resulting from it. This

is the usual attitude: the man in the street regards the acorn as of the same species as the oak, the human embryo as that of man, the hen's egg as that of the hen, the frog's spawn as that of the frog. And, indeed, this is in accordance with a recognised and necessary form of biological classification. When the biologist speaks of biological species, he is intending to distinguish, not actual characteristics, nor existents in virtue of actual characteristics; but various series of material-groups in which no group has not some matter in common with its successor and some with its predecessor. The biologist might express this by saying that biological species are ~~not~~ types, not of static existents (or characteristics of such an one), but of developing organisms. Many would interpret the latter sentence as ascribing, in addition, a greater degree of unity and continuity to such series than many modern philosophers would think justified, supposing for example that in acorn, seedling, sapling, and oaktree (when common members of such a series) is to be found a common entity in different stages of development. Thus the plain man having planted lettuce seed, will point to plants subsequently growing at the same place and say 'There are the lettuces I planted'— convinced that he sees 'what he planted' after this has undergone some alteration and addition. The modern critic of this view points out that not only is there neither structural nor material identity between seed or embryo and full grown organism, but that the latter may contain none of the 'matter' present in the former - as in fact is true of the human organism. This being so, they urge, it is both mistaken and misleading to speak as though identity is maintained

throughout an organism's history.

Whether one agree with this criticism or no, one cannot, without refusing the evidence of experience, hold it reasonable to deny the truth of hypothetical assertions consistent with, and expressible in terms of, the existence series of material groups in which there is no group not having some matter in common with its predecessor, and some in common with its successor. Nor can one with any justification reject the hypothesis that such series would be of different types. For experience, though rich in evidence for both hypotheses, provides none which supports the rejection of either.

Furthermore there is strong evidence for ascribing regularity to such series. Repeated observations have provided good evidence consistent with the assertion that 'a seed which has come from a lettuce' always belongs to such a series, which latter also contained previously 'a full grown lettuce', and will, under certain circumstances, later contain another. And observation has further provided good evidence consistent with the conclusion that, under given circumstances, such a seed has always the same relation within a series of this type to an earlier and later lettuce, and likewise has always the same relation within it to a material group of any one specified type among those regularly found within it. And the evidence is further consistent with analogous conclusions about lettuces. And similar evidence has been amassed relevant to each analogous postulated series which has been subjected to investigation.

If, therefore, the assertion 'at fertilisation is produced a seed or embryo of the same type as the complete organism of which this is the forerunner' is intended to be understood as saying that at fertilisation is produced a material group belonging to such a series which is similar in type to that to which another group of a given character belongs; then it must be admitted that this is an assertion consistent with the evidence, and one moreover whose denial on any ground other than the refusal to interpret any of the phenomena involved in terms of continuants at all, must on any view be regarded as inconsistent with the evidence. But it must also be admitted that it is quite unlike the assertion which Aristotle intends to make when he says that a craftsman confers the form of a statue or bronze or marble. If, therefore, the former is what he intends to assert in saying that at fertilisation the 'form' of a complete organism is conferred on 'matter', his usage, in suggesting both assertions to be analogous, is so misleading as to call for unequivocal condemnation. And even though it be allowed, as indeed it must, that Aristotle supposes there is something which may be said to persist through the development of an organism, and which may further be said in some sense to possess a given nature throughout; to speak of conferring the form of such an one must still be regarded as saying something very different from speaking of conferring the form of a table or chair. For if something can be said to persist throughout the development of an organism, and to exhibit the same nature throughout, clearly it must be supposed 'to be one' and 'possess one nature' in a sense

very different from that in which Aristotle supposed this to be true of chairs and tables.

Not only does Aristotle adopt an usage so ambiguous, in his general application of the fourfold analysis; but he appears to be unaware of its ambiguity, completely failing either to point this out or to make his own position explicit. Clearly if a general application of the fourfold analysis is to be adequate, it demands a much preciser examination of both the notions concerned and the phenomena to which they are applicable.

(e) Aristotle's identification of 'formal', final' and 'efficient cause'

Having carefully distinguished 'the four causes' one from the other, Aristotle disconcertingly proceeds to remark (76) that three of these may be regarded as identical. This might, at first sight, appear simple self-contradiction; for clearly to distinguish A, B, and C, is to deny their identity in at least one respect. But the very evidence of the contradiction involved if Aristotle's assertion of identiy between these three 'causes' is understood in the same sense as his distinction between them, makes it unlikely that he should have been guilty of it. I think, therefore, that in asserting the identity of 'formal', 'final' and 'efficient cause', which he previously distinguished, Aristotle must be understood as saying that there is one factor in change - namely 'form' - which may be said to fulfil three distinct explanatory roles. It seems to me that he must be regarded as saying in effect: (a) that exhibiting a given 'form', or specific nature, is a condition of this

'matter' constituting a certain type of existent - exhibition of that nature being properly called 'formal cause' of such a thing's existence; (b) that it is only in virtue of possessing this same specific nature in some manner that an agent is able to confer it on 'matter' - that nature's thus making possible the process constituting its being conferred on something else being properly called 'efficient cause' of that so produced; (c) that the exemplification of that specific nature is the 'end' of the process by which such an object is produced, that towards which it is directed - and as such it is a 'final cause'. Thus he holds that marble can constitute a statue only by exhibiting a certain type of character, which in this role constitutes its 'formal cause'; and he further supposes a statue could not come into existence were not an idea of that character in the mind of a sculptor, enabling him to make it and thus constituting its real 'efficient cause'; and finally he holds the process, thus made possible, to be directed to the exemplification of that character (the attainment of which end being also in this instance a conscious purpose provoking that process) which constitutes it a 'final cause'.

This interpretation of Aristotle's 'identification' of 'formal', 'final', and 'efficient cause', is born out by many passages. The above view of the role of a 'form' or character constituting it a 'formal cause' is evidenced by Aristotle's explicit definitions of 'formal cause', where he defines such an one simply as an 'essence' or specific character (77) whose most obvious role (and that attributed to it when Aristotle refers to it without qualification, as in discussing the possibility of producing a form) (78) is that

of constituting a quantity of 'matter' a specific type of existent. The above interpretation of the role of 'form' as 'efficient cause' is made explicit in the De Generatione Animalium' (79) where Aristotle affirms that 'as the products of art are made by means ... . of the art, and the art is the form of what is made in something else' so is it in generation. And this interpretation is further supported by other passages. Thus in the chapter in the Physics devoted exclusively to the analysis of 'causation', a builder is said to build 'in virtue of his art of building'; (80) while in the Metaphysics (81) 'the building art' is described as 'the form of the house'. And the above interpretation of the role of 'form' as 'final cause' is supported by many passages. Not merely in his explicit definitions of 'final causation', but constantly throughout his works (82) Aristotle describes, and refers to 'final causes' as those 'for the sake of which' changes occur. And it is sufficiently clear that the role of a form as that 'for the sake of which' or to attain which, a change occurs is very different from its role as characterising that brought about by the change. This distinction seems evident in one of the passages (83) which, in Aristotle's terminology, treat 'formal' and 'final cause' as 'identical' - where he writes of the products of change: 'cause in the sense of their 'end' is their 'figure' or 'form' - and that is the formula expressing the essential nature of each of them'. For clearly though to say A's existence is the achievement of the exemplification of a given character implires that A exemplifies that character, the

two assertions are not synonymous; for the one states the 'forms' relation to the process of change ending in its exemplification, while the other states its role in the constitution of that exemplifying it.

But although one must allow the consistency of Aristotle's fourfold classification of 'causes' with what he intends to assert in affirming the 'identity' of three of them; one must nevertheless deplore his mode of expressing it as wholly misleading. The foregoing should have made it clear that, though for Aristotle a 'form' can and does fulfil the role of 'formal', 'final', and 'efficient cause', the three latter terms are by no means synonymous as they would be were it correct to describe 'formal', 'final', and 'efficient causes' as 'identical'. Aristotle's terminology, therefore, both lays him open to a charge of verbal inconsistency, and fails to express his meaning accurately according to the linguistic rules ordinarily exemplified in his writing.

It remains to ask whether what he intends to assert in affirming the 'identity' of 'formal', 'final' and 'efficient cause' is justified. It is at once evident that his contention, even on its simplest and most obvious interpretation, is by no means unfounded. All the changes which he considers may be, and by him must be, regarded as directed towards the exemplification of a specific character, this exemplification in its turn being regarded as that which makes the outcome of such change what it is. Moreover there is good inductive evidence that many of Aristotle's 'efficient causes' possess, in some sense, the 'form' which they

confer. Sculptors have not been found to produce statues without having an idea of the character of a statue; plants and animals which differ specifically from what may be regarded as the nature common to both parents, are not generated. And the two other types of 'efficient causation' most frequently mentioned in his works are: the passage of heat from a warmer to a colder body, and a body's being set, or kept, in motion by being pushed or pulled by another already moving. Nevertheless the 'identification' of 'formal' with both 'final' and 'efficient cause', is a less simple question than this, each 'identification' indeed, raising its own problems and demand for clarification.

I will deal first with the 'identification' of 'formal' and 'final cause', as the simpler and that of least historical importance. While it is undeniable that for Aristotle all change must be directed towards the exemplification of the character in fact conferred by it, it is equally true that he himself postulates 'final causes' consisting in the achievement of something different in character from the 'effect' he attributes to them. Thus, for instance, he specifies the attainment of power as a possible 'final cause' of going to war; (84) and clearly the achievement of power is specifically distinct from going to war, even when the former results from the latter. Nor can going to war even be identified with the process of achieving power, since clearly if one side gains power by going to war, the other must lose it. This example makes it clear that if 'formal' and 'final cause' are to be 'identified' in the sense in which Aristotle frequently asserts them to be,

'final cause' cannot be identified with purpose if this extends beyond an immediate course of action such as going to war or producing a statue. For it has not been unknown for a race or ruler to go to war to achieve power and to fail to achieve that end. And there are many other instances when action is undertaken to achieve a purpose, but is unsuccessful in this. If therefore 'formal' and 'final cause' are 'identifiable' in the Aristotelian sense, such unfulfilled purposes can be called 'final cause' of no actual 'effect'.

And if this 'identification' is maintained, then even when a long term purpose, such as the achievement of power, is fulfilled, one would have to distinguish between the purpose constituting its 'final cause', and the subsidiary purpose properly called 'final cause' of the means adopted to achieve this end. For instance one would have to distinguish between the purpose of achieving power as 'final cause' of the whole process culminating in its achievement, and the incidental purpose of going to war properly to be regarded as 'final cause' of this condition of, or means to, that end. Here once more, so far from attempting to clarify the ambiguities in his position, Aristotle appears unaware of them.

The 'identification' of 'formal' and 'efficient cause' is of considerable historical importance as the source of the conviction that a 'cause' must resemble its 'effect'. The modern philosopher will at once point out that, if we are justified at all in postulating 'efficient causes' in the Aristotelian sense, we must postulate many to which we have no ground for attributing the character of their 'effects'. Thus it may be said that the bacteria which might be

described as 'efficient cause' of a person's suffering from food poisoning, have not themselves the characteristics of one so afflicted; nor, unlike mumps' and measles' germs, can they even be supposed to come normally from such an one. Nor, it might be pointed out, could we be supposed to have any ground for supposing bacteria to have the idea of the illness they produce, as does a sculptor of the statue he chisels. Such an argument, however, while it would show a modern philosopher unjustified in holding that an 'efficient cause' must either entertain the idea of its 'effect', or actually exhibit the same specific character; could should Aristotle to be unjustified in supposing so, only if it could show this to be untrue of one of the 'efficient causes' he recognised. It might perhaps, be contended that, in postulating unmoved movers Aristotle himself was allowing the existence of 'efficient causes' lacking that which they produce - namely motion. But it seems sufficiently clear that although Aristotle insists (85) that all motion presupposes some physical objedt which is at least relatively motionless, the only unmoved movers he postulates which he can properly regard as 'efficient causes' are God and other minds, which can be regarded as conceiving the motion they produce as a sculptor conceives the statue he chisels. To speak of an animal's soul in the sense of its 'form' or character (insofar as this is exhibited by it) as 'cause' of its motion, is to say that an animal is such as to move - which is clearly not to attribute an 'efficient cause' to its motion in the sense in which a builder could be called 'efficient cause' of a house, or nerves and muscles (or even the

mind insofar as its conscious intentions could be regarded as stimulating nerves and muscles) could be ~~regarded~~ supposed 'efficient cause' of movement. Nor can the relatively stationary earth and joints which Aristotle regards as conditions of walking in providing something firm against which the limbs can push, or the relatively static shore which he cites as fulfilling the same function when a boat is pushed off, (86) be regarded as 'causing' in a sense analogous to producing a statue or bowl or generating. Yet Aristotle does seem to postulate one type of 'efficient cause' which can in no sense be said to confer a character in virtue of possessing it, namely the heavenly bodies insofar as their movement is regarded as bringing about, or making possible, generation and decay in general.

For aristotle insists that they themselves are incorruptible, and as there seems to be no question of choice in the matter since the movements of the heavenly bodies are regarded as determined, the attribution of them of minds (which is sometimes suggested) which could conceive this 'effect' would seem irrelevant.

It seems to me, however, that when Aristotle maintains that an 'efficient cause' must possess the 'form' of its 'effect', he does not mean that the former must either exhibit the latter or entertain an idea of it. This is indicated both by his attribution of the 'form' conferred to the instruments used by the 'efficient cause' in producing its 'effect' and by the terms in which he asserts this. It is indicated by the mere attribution of the 'form' thus conferred to these instruments, since these clearly do not exhibit it as does the 'effect', nor can they be supposed to entertain its

idea. Chisel and saw obviously do not exhibit the characteristics of statue and chair respectively, and it seems as obviously unreasonable to suppose either tool to entertain an idea of the object it is instrumental in producing. And this conclusion is confirmed by the passage in the De Generatione Anaimalium (87) already quoted in part, where Aristotle writes: 'as the products of art are made by means of the tools of the artist, or to put it more truly by means of their movement, and this is the activity of the art, and the art is the form of what is made in something else, so it is with the power of the nutritive soul'. For the most obvious interpretation of the assertion that a statue is produced 'by the activity of the art' (here explicitly identified with 'form') is that it is brought into being by the active fulfilment of the power to make it. And this interpretation is supported by Aristotle's explicitly asserting this role of art or 'form' in artificial production to be analogous to 'the power of the nutritive soul', which latter can hardly be regarded as other than its ability to produce growth and generation. It therefore seems that ascribing the 'form' it confers to an agent or instrument, is, for Aristotle, essentially the ascription to it of the power to confer that 'form' - to which power exhibiting the 'form' in question, or entertaining its idea, is not always necessary.

It will be objected that, if in ascribing the 'form' it confers to agent or instrument Aristotle need be regarded as attributing to it no more than the power of producing a given 'effect', his contention is a useless tautology. That it is tautologous in the sense that to call A agent or instrument in the production of B, is

to call it capable of either bringing B into existence or enabling it to come into existence, as indubitable. That it is useless cannot, I think, be regarded as true unless all definition is regarded as useless. And it seems clear that a definition is useful at least insofar as it makes explicit how a term is being used, or at least how it is meant to be used. And the definition under consideration seems to me extremely important in this respect. That the power of conferring a 'form' can be regarded as possession of that 'form' and a significant condition of conferring it, depends entirely on the view of 'causal' connection as intrinsic. Aristotle, in supposing an 'effect' intrinsically dependent on its 'cause' was thereby justified in, and indeed comitted to, the supposition that every agent and instrument is essentially such as either to produce or make possible its 'effect' (as this is necessary or no respectively). And this is to regard that capacity as intrinsic to the agent's or instrument's definition, which may thus be said to include that of its 'effect'; or, to put it another way, it is to suppose it impossible fully to understand the character of the agent or instrument without understanding that of its 'effect'. Thus, for instance, on this view, to fully understand the character of a chisel is to see it to be such that, under given circumstances, it cannot but cut marble so precisely as to thus form it into a statue. Whether a philosopher so conceives any or all 'causal conditions, clearly makes a great difference to his treatment of 'causes' and 'effects', and his inferences from postulated 'causal' connection; and it is therefore of great importance to have his

position in the matter made explicit.

Many philosophers who are far from being Aristotelians have so conceived 'causes', many regarding them in addition as all intrinsically entailing the existence of their 'effects'. The notion has therefore played an important role in many discussions concerning, or assuming 'causation', even among those who would be emphatic to deny 'resemblance' between 'cause' and 'effect' or the 'possession' of its 'effect's form' by a 'cause'.

(f) Teleology.

As in many other features of his treatment of the 'four causes', Aristotle's statements about 'final causation' are not free from ambiguity; but unlike his treatment of other aspects of the fourfold analysis, his view of 'final causation' is itself inherently contradictory.

If one suppose the universe the voluntary creation of a God who is omnipotent, intelligent, and good; then one must hold, not only that its creation may be supposed to fulfil a purpose, but that its constituents are of such a nature and so arranged that this will be achieved as conveniently and adequately as possible. That is to say, one must regard the constituent elements of the universe as analogous to the parts of a precise and delicate mechanism, each deliberately and carefully designed to fulfil a role contributory to some end such as the precise recording of radioactivity.

Although Aristotle maintains the existence of a good and intelligent God, however, he supposes neither Him, nor anyone else, to have created the universe—which latter he regards as eternal.

In his view therefore, though God is responsible (either directly or indirectly) for all change, He is not responsible for the universe's basic constituents being such as to render possible certain types of change under given conditions. Aristotle has, therefore, no ground for affirming teleology in the sense of conscious purpose governing everything within the universe; nor does he attempt to maintain this, but rather is explicit in its denial. For not only does he maintain (88) that it is unnecessary to 'observe the agent deliberating' in order to postulate 'final causation' (a contention in itself quite consistent with the belief that the existence of such deliberation is yet inferrible), but proceeds to defend this contention by arguing that deliberation itself is unnecessary to 'final causation'. Thus he writes: (89) 'Art does not deliberate. If the shipbuilding art were in the wood, it would produce the same results by nature. If, therefore, purpose is present in art, it is present also in nature'. And he adds, not wholly helpfully, 'The best illustration is a doctor doctoring himself: nature is like that'. (90) This illustration is hardly 'the best' as Aristotle optimistically suggests, since a doctor cures neither himself nor anyone else automatically without conscious thought. Presumably Aristotle's point is that as medicine is essentially directed towards the achievement of health, so is each natural process directed, of its nature, to the attainment of an end. The position he is intending to maintain in urging the universality of 'final causation', would thus seem to be analogous to that of Leibniz (91) and Stout (92) insofar as they regard 'causal' process, properly

so-called, as essentially the fulfilment of an inherent tendency in that which changes. (Change, for them, being always referable to a continuant).

If a causal process is so conceived, however, its end, regarded as something distinct from itself, can be said to 'cause' it neither in the sense of entailing it nor as that on which it is dependent, unless the change is regarded as the deliberate pursuit of that end either by the subject of the change or by another. For clearly, save insofar as it can be entertained in thought and thus render a course of action either inevitable or merely possible, the end, as something distinct from the process towards it, does not exist until achieved; and hence neither does a relation between it and the process towards its achievement. An end, therefore, could be regarded as 'cause' of the process towards it, only insofar as it entered into the latter's definition and hence into its 'formal cause'. That is to say that an end, not deliberately sought, could contribute to the explanation of the process towards it, only in the sense that the question 'what makes this process what it is?' could be answered with: 'its being intrinsically such as to achieve a specific type of end'. But this certainly does not seem to be what Aristotle intends either in affirming the 'final causation' of phenomena other than voluntary human behaviour, nor in 'identifying' 'formal' and 'final cause'. My interpretation of the latter 'identification' has already been outlined and defended.(93) The truth of the former assertion is witnessed by the fact that Aristotle makes it clear (94) that he supposes 'final causation',

outside the sphere of voluntary action, a determining principle to which natural necessity is subordinate - a role which the former certainly could not fulfil in the capacity of 'formal cause' in the strict sense of the term.

Aristotle's conviction that, in postulating 'final causation outside the sphere of voluntary action, he is opposing those who suppose physical processes to be necessary, is completely inconsistent with his postulation of non-deliberate 'final causation' which can only be conceived as inherent tendency to achieve a given end. For, in effect, to say that A is intrinsically such as to progress to the achievement of B under given circumstances, is to say that it must alter in a certain manner under those conditions.

iv. The significance of Aristotle's postulation of chance.

Today, the adjectives 'chance' and 'haphazard' or 'lawless', are generally treated as synonymous. Thus when a philosopher who postulates 'universal causation' discusses 'chance events', in the sense of those not justly inferrible with the confidence with which a well attested 'causal connection' may be expected to hold; he generally insists that the element of 'chance' is due to the limitation of our knowledge and is not, properly speaking attributable to the events themselves, which must be supposed to exemplify regular correlations as must all other phenomena. At first sight, therefore, Aristotle's insistence that there are events which may properly be said to happen 'by chance' (95) might suggest to the modern reader that he supposed there were events which occurred irrespective of the character of any prior or simultaneous conditions.

It is clear, however, that though he aligns the 'chance' with the 'indeterminate', (96) Aristotle does not suppose the 'chance' events he postulates to occur at random. Thus he cites as instance of a chance event-A's collecting a subscription from B because they happened to meet at C, though neither went there with the intention of meeting the other; but he does not suggest either's being there then to have occurred at random. He says explicitly (97) 'the causes of the man's coming and getting the money (when he did not come for the sake of that) are innumerable. He may have wished to see somebody or been following somebody or avoiding somebody, or may have gone to see a spectacle'.

Aristotle's definition of 'chance' rests on his conception of 'final causation', a 'chance' event being for him one which is in fact the achievement of something (such as the collection of the subscription) the attainment of which might have been a conscious purpose which caused that event to occur (e.g. A might have gone to C because he intended to meet B there and collect his subscription). He confines the title 'chance' to events which might have been deliberately intended, but supposes these a subsection of a wider class 'the spontaneous' which includes every event which is the achievement of an end ~~which is~~ not describable as its 'final cause': as examples of 'spontaneous' but not 'chance' actions, Aristotle cites a horse saving himself by coming to a certain place although his action was not directed towards that end, a tripod falling so as to form a seat although the attainment of this end could in no sense be called the 'cause' of its falling thus. His choice of examples might at first sight suggest that Aristotle regards the behaviour of non-rational things spontaneous when it might have fulfilled a deliberate purpose such as the intention of escaping. But as Aristotle, in denying the end they achieve to be the 'final cause' of 'spontaneous' events, is intending to distinguish them from other non-rational behaviour, moreover reiterating at the outset of his discussion of chance (98) that of things 'which are for the sake of something' some 'are in accordance with deliberate intention, others not', it is clear that this is not so. Taking his treatment of 'chance' events (strictly so called) as an analogy, it seems that one must

suppose that in denying the horse's safety (which it in fact achieves) to be 'final cause' of its coming, he is implying that there is another end properly so-called (e.g. his arriving here) to which his being saved is incidental. And similarly with the tripod's fall: Aristotle's view, presumably, is that its fall is intrinsically such that it must land on its feet, and that its landing so that it is capable of providing a seat is merely incidental to this.

This is, indeed, the most significant aspect of Aristotle's treatment of 'chance' and 'spontaneity' in that it emphasises strikingly the fundamental element in his conception of causation, which has been seen to be intrinsic to his 'identification' of 'formal' and 'efficient cause', - namely the definition of a 'cause' properly so-called as the intrinsically necessary condition of its 'effect'. It is true that he does not refuse the title 'cause' to the 'accidental cause', that which can be said to be a condition of A's existence in virtue merely of a de facto correlation with an intrinsically necessary condition of A. But whenever he admits this usage, he is careful to distinguish the 'accidental cause' from the cause 'per se'; his very practice of describing them so sufficiently testifying to his view of the matter. Moreoever, ordinarily when discussing anything's 'causes', he considers only what he regards as its intrinsically necessary conditions; and whenever he uses the term 'cause' without the qualification 'per se' or 'accidental', he applies it to such a condition thereby indicating that this is, to his mind

the natural use of the term.

It is this conception of 'causation' rather than that of 'final causation' (which merely provides the framework in which his treatment of 'chance' is framed), which allows Aristotle to admit events which are 'chance' or 'spontaneous' in their own right, without admitting lawlessness within the universe. The 'chance' event is regarded as such, not because it occurs irrespective of any condition, but because it depends on at least one condition which is not in itself intrinsically necessary to it.

Aristotle's treatment of 'chance' and 'spontaneity' is interesting and important in that it leaves no doubt that, although Aristotle does not, as has been seen, (99) conceive 'causation' in terms of 'natural law' in the sense in which the modern philosopher generally does, he yet supposes a 'causal' connection properly so-called exemplifies a law. (It will be clear from what has gone before that this may, and indeed often does, state merely the dependence of a given type of effect on a specific 'cause'). For in distinguishing the 'chance' event from what can properly be described in terms of his 'four causes', he is in effect distinguishing an even't dependence on a complex situation, from the specific dependendes he supposes the condition of this. His distinction is thus analogous to that between assertions like 'Arsenic causes death' and those like 'The train crash caused his death', when the latter is understood to assert the dependence of 'his death' on a complex situation in virtue of its exemplification of various 'laws' of dynamics and physiology.

The distinction is extremely important in that it is a condition of any comprehensive understanding of experience and any reliable prediction. Complex situations, such as the accidental meeting of A and B, and Z's death in a train accident, are rarely repeated in all their details; and when they are, little is to be gained save evidence concerning complexes exactly similar in type unless they may be regarded as exemplifying principles of more general application. But this latter is possible only if they are analysed in terms of 'laws' or correlations there is reason to suppose exemplified both in these and other situations. That Aristotle not only assumed this distinction, but was careful to make it explicit, is significant as testifying to his recognition of the importance this basic condition of science.

v. The Cosmological Argument for the Existence of God.

Aristotle appears to have been the first philosopher to formulate the cosmological argument for the existence of God. His use and treatment of the argument provides important evidence of the conceptions underlying his treatment of causation, his mode of framing it providing useful evidence of his use of terms. His use of the argument is, moreover, of considerable historical importance, since it was due to his influence on St. Thomas Aquinas that the essence of this argument became the generally accepted Christian demonstration of the existence of God; and there seems no doubt that its reappearance in more or less fresh guise in the works of Descartes and Leibniz was due to the intellectual climate thus created. Perhaps even more important, historically were the notions presupposed in the argument, whose general acceptance therefore ensured their being so intrinsic to Europe's intellectual atmosphere, that they were fundamental to much that was written by the outstanding seventeenth century philosophers who explicitly rejected the Aristotelianism which had governed European thought during the past three centuries. (100)

Aristotle devotes some space to this argument which he formulates more than once (100) but its essence may be briefly stated. It consists in deducing the existence of an unchanging source of change (in the sense of an unchanging 'efficient cause'), (101) on the ground that all change depends on a 'mover' or 'efficient cause' external to that in which it occurs, and no 'causal' series is infinite. The argument as formulated by

Aristotle thus rests on his definition of change in terms of an agent's conferring a specific character on a continuant. And it also pre-supposes both the definition of 'causation' in terms of the intrinsic dependence of 'effect' on 'cause' and the belief that everything is explicable in the sense of existing in virtue of some condition (whether this latter is intrinsic or extrinsic to itself) - which have both been seen (103) to be demanded by the denial of an infinite regress. Indeed universal explicability, so understood, is the basic principle on which depend all the varying forms of this argument which philosophers have framed. For each of these consists, basically, in contending that there must be something the explanation of whose existence lies in itself, because there is something not thus self-explanatory or self-sufficient, whose existence would be inexplicable did it not derive from such an one. It has already been seen (104) that the phenomena of change, however interpreted, presuppose such a self-explanatory condition, if the principle of universale explicability is true. To deduce the existence of God, so conceived, from the principle of universal explicability, it is necessary indeed to know only that something exists, irrespective of knowing it not to be self explanatory. For given that the principle is true, and that something exists; then this something must either be self-explanatory, or else depend for its existence on something which is. Those philosophers who have used the cosmological argument, have done so, I think, because they wished to prove, not merely that there is something the explanation of

whose existence lies in itself, but that this something is distinct from the phenomenal universe, to do which it is necessary to point out that this universe does not itself fulfil this role. That Aristotle supposes God to be distinct from the phenomenal universe whose changes depend on Him, is put beyond doubt by his combining the postulation of God as Prime Mover (i.e. first 'efficient cause') with belief in the eternity of the universe. It is thus clear that for him God is first 'efficient cause', not as the first term in a succession of agents, but as a condition of their agency which lies outside that succession. His conception of God is in this respect analogous to Kant's conception of Things in Themselves; though Kant eschewed Aristotle's terminology, confining the title 'cause' to phenomena, and denied the possibility of doing more than postulate such a condition (or conditions), while Aristotle supposed it possible to draw further conclusions concerning God.

Aristotle's use and treatment of the cosmological argument has been seen to provide further evidence of the notions discoverable throughout his treatment of causality - namely universal explicability; the interpretation of change as an agent's conferring a specific character on a continuant; the definition of 'change' in these terms, and of 'cause of A' as 'indispensable condition of A'. More important still, as unmistakably regarded as demonstrating the dependence of phenomenal change on a condition external to the phenomenal world, which condition is yet described as 'cause' (105) and 'mover' (106) (a term ordinarily

used as synonymous with 'efficient cause'), his use of the argument testifies not only to his regarding the postulation of such dependence admissible, but also to his rejection of any definition of 'causation' which would confine its application to relations within the phenomenal universe. It thus excludes, for instance, its definition in terms of temporal relations which could not be assumed to hold outside the phenomenal sphere, as well as any conclusions resting on such a definition. Thus, even though all the 'causal connections Aristotle postulated within the phenomenal sphere could have been conceived in terms of natural law as may the 'causal' assertions of most modern philosophers; his use of the cosmological argument as proving the existence of an extra-phenomenal 'cause', would have rendered his use of the term fundamentally different from that adopted by most modern British philosophers.

Aristotle's conception of the First Mover as outside the succession dependent on Him ensures his avoiding the Kantian antinomy, (107) which latter arises when the existence of a first cause, in the sense of a first term in such a succession is inferred from a generalisation about the members of that succession which excludes the possibility of its having a first term.

Russell (108) criticises Leibniz's version of the cosmological argument as being formally invalid in that it claims to infer the necessary from the contingent. (My earlier account of the essence of all forms of the argument, should have made it clear

that this criticism would, if sound, apply equally to all its versions whether the terms 'necessary' and 'contingent' were used in framing them or no). Russell's objection seems to rest on confusing the assertion that A presupposes B in the sense that it could not exist without B, with the assertion that A entails B in the sense of making B exist; it is in effect to regard 'This picture could not have existed in the absence of an artist' and 'This picture forced an artist to exist', as synonymous. The confusion arises naturally from Russell's regarding 'necessary' and 'entail' as terms properly applicable to linguistic relations alone. To say that one set of symbols is entailed by the conjunction of others, is always to say that according to a certain set of rules the former set of symbols may be substituted for the conjunction of the latter; and there is no possibility of the assertion of one set of symbols being entailed by others, being legitimately capable of two quite opposite meanings. Once admit, however, that the existence of one situation may be deducible from that of another irrespective of linguistic rule, and it becomes possible to assert A to entail B thus, either in the sense in which a picture might be regarded as requiring a painter in order to exist, or in that in which the taking of arsenic might be supposed to make someone die. Obviously the existence of something contingent could not entail that of something necessary, in the sense of being that in virtue of which the latter existed; but this does not exclude the existence of the former entailing that of the latter, in the sense

in which that of a picture is generally supposed to entail that of an artist. And a philosopher who denies non-linguistic entailment is not thereby exonerated from noting the relevance of this distinction in the arguments of others who admit it. (109)

Those who confine the title 'significant' to assertions observationally testable, at least in the sense of being falsifiable, must dismiss the conclusion of the cosmological argument as non-significant. Since, however, this conclusion appears to be legitimately deducible from its premises, and it would seem unreasonable to suppose a non-significant conclusion entailed by significant premises, one holding this view must, if he is to be consistent, suppose one of these premises non-significant also. And it is indeed true that, according to his criterion its basic premise, namely universal explicability must be regarded so. For it is not observationally testable by us, since its truth is consistent with anything we might experience. It is, on the one hand conceivable that although nothing occurred or existed irrespective of some condition, the universe might be so complex or our powers of perception so limited, that we might be able to discover no regular correlations within it, or at most very few. On the other hand, the appearance of regular correlations within experience might be fortuitous and not the result of the dependence of one type of existent, quality, relation, experience, or experiential complex, on another. It is possible, therefore, when regarding observable testability as the criterion of 'significance, to describe the conclusion of the

cosmological argument as non-significant, without self-contradiction.

It seems to me, however, that the very possibility of recognising that an assertion is not experientially testable, shows the inadequacy of observational testability as a criterion of 'significance', if a non-significant sentence is to be regarded as a set of symbols incapable of expressing anything beyond a verbal rule. For it is clearly not the testability of a verbal rule which is here in question, and unless a set of symbols states something, and I can recognise it to do so, how can I possibly know whether or not a given type of experience would be relevant to its truth or falsity?

I have said (100) that I can find no argument which could prove the truth of the principle of universal explicability, nor does its truth seem self-evident. I have contended, (110) however, that it cannot be consistently denied by anyone accepting the legitimacy of induction (which includes plain men and most, if not all, philosophers). It seems to me, therefore, that since the phenomenal universe must be regarded as consisting of either tranaitory existents, or changing continuants (or both), neither of which could be regarded as containing the condition of its existence within itself, (111) the cosmological argument demonstrates that few, if any, can deny its conclusion with consistency; and that neither, therefore, are they in the position to deny the possibility of the dependence of the phenomenal on the non-phenomenal, which it involves. But this, of course, does not preclude the definition of 'causation' so that the term is inapplicable to such a relation.

vi Summary.

Aristotle shares with plain men the definition of 'causation' in terms of the intrinsic dependence of 'effect' on 'cause', the interpretation of experience in terms of continuants, and the belief in universal explicability. Consistently with these premises, he conceives change as the conferring of a specific character on one continuant by another. He distinguishes as four types of 'cause', the four types of conditions he regards as essential to change so conceived; namely 'form', 'matter', agent, and end (or 'final cause'). These, on any interpretation, represent distinctive factors among the conditions of artificial making, which for Aristotle is the paradigm of 'causation'. And one accepting his premises must, to be consistent, interpret them as he does. 'Form', 'matter', and agent, also constitute distinguishable factors in other types of change; but it is often inconvenient to describe these in terms of them. Aristotle's attempt to do so is, to say the least, ambiguous; and indeed, capable of being positively misleading. His view of 'final causation' outside the sphere of human voluntary behaviour, on the other hand, is inherently contradictory. He explicitly denies its being deliberative, and hence cannot regard it as other than an inherent tendency towards an end. But, inconsistently with this position, he treats it as determinative in a sense other than merely definitive, and as refuting the assertion of natural necessity.

Aristotle's definition of 'cause' is intrinsically different from those common among most modern British philosophers in being inconsistent with the conception of 'causation' in terms of natural

law'. Yet at the same time, for him, to state a 'causal' connection properly so-called, is to assert a law - namely one of intrinsic dependence. And he is careful to distinguish these specific laws of dependence, from dependence on a complex situation in virtue of them.

An even more fundamental difference from common modern usage is revealed in his postulation of God, as first 'cause' of change, existing outside the phenomenal sphere. The comological argument, a version of which he uses to defend the postulation of God as fulfilling this role, seems to show that the possibility of the dependence of phenomenal on extra-phenomenal, cannot be denied. But it does not demand the application of the term 'cause' to such an extra-phenomenal condition.

Through the instrumentality of St.Thomas Aquinas, Aristotle's describing God, as 'cause' of phenomenal change, and his view of an 'efficient cause' as essentially such as to be capable of producing a given 'effect', had a profound influence both on the use of the term 'cause' and the development of the notions associated with it in Europe from the thirteenth to the seventeenth century.

NOTES.

1). Ch.1.

2). Physics 11 3, 194b 20

3). Phys. 11 7, 198a 15

4). Ch.1.

5). Cf. for instance the argument that the 'First Mover' being unchangeable, exists necessarily (i.e. is such that he cannot but exist) which is to say that the explanation of his existence lies in Himself (Metaphysics X11 6 1072b 8-11); and the unambiguous reiteration of the same conclusion later in the same chapter (1072b27ff).

6). Phys. 11.3, 195a 2

7). Phys. 11 7, 198a 18

8). Phys. 11 3, 195a 18; Posterior Analytics 11 2

9). Post. An. 11 2

10). Phys. 11 7 198a 18

11). Ibid.

12). The mathematical definitions Aristotle cites as examples are all geometrical.

13). Introduction to the Physics p35

14). Logic Bk 111 Ch V Sect 3

15). Sect iii (b) pp.183-193

16). Sect.iii (c), (d), (e) and (f). pp.193-226
There is no doubt that in listing the 'four causes' and in claiming exhaustiveness for the list, Aristotle intended to enumerate not individual conditions, but types. That he supposed an 'effect' to depend on more than four individual conditions is evident from the conviction, intrinsic to his arguments against the possibility of an infinite 'causal'

16). regress, that an 'effect' depends on all the antecedents of its immediate 'causes'. That he does not regard this conviction as conflicting with the doctrine of the 'four causes', is clear from his statement of these arguments in terms of it.

17). Cf.Metaphysics Vll 8.

18). Cf. Metaph. Vll 7,8.

19). The substitution of mere verbal manipulation for thought is difficult to avoid when one is using language constantly, consequently there must have been many minor or pseudo-philosophers who were guilty of it. In attributing this practice to the later Scholastics, therefore, I do not intend to imply that it was peculiar to them.

20). Metaph. Vll 8 1033a 24-1033b 30.

21). Phys. ll 3 194b 28; Metaph. V 2 1013a 28

22). Metaph. Vll 8 1033a 24-1033b 30

23). De Anima ll 1 412a 1 - 413a 10

24). De An. lll 5 430a 10-25

25). Metaph. Vlll 2 1043a 12-28; Vlll 3 1043a 30-1043b 1; 1044a 24-30; Vlll 6 1045b 18; 1050b 1; 1069b 15; 1007b 28 De An. ll 1 412a 10 - 413a 3.

26) Cf.The Monadology (trans.by R.Latta: Clarendon Press 1898) 40 p.p. 239-40. 54p 247; On the Ultimate Origination of Things: p.340 (L); G Vll 194.

27) p.166 Cf.Aristotle's criticism of the Platonic doctrine in Metaph. Vll 8.

28) Metaph. Vlll 1 1042a 25-30; De An. ll 1 412a 7-11.

29). Metaph. Xll 6 1071b 18

30). Metaph. Xll 6, 1071b 20; 1072b 27

31). Metaph. Xll 6 1071b 20-1.

32). Metaph. 11 2 994a-994b 30; X11 6 1071b 1-21; Phys. V11

33). p 163

34). This argument is basic to all Aristotle's arguments against the possibility of an infinite 'causal' regress.

35). pp. 176-7

36). Metaph. X11 6 1072b 4-15

37). Metaph. 1044b 1; De Generatione et Corruptione 11 9 335b 7; Metaph. 1050a 9ff

38). Phys. 1 9 192a 25-33

39). De Gen. et Corr. 11 4 & 5 331a6-333a15

40). De Gen et Corr 114 332a 5-26

41). Ibid 11 5 332a 27

42). Metaph. 11 2 994b 5

43). De Gen. et Corr. 1 5 320b 16

44). Phys. 11 3 194b 16-195a 1; Metaph. V 2 1013a 24-1013b 3

45). Cf. Ross who, while not committing himself definitely, evidently regards that in the Physics as the earlier account, noting that in Metaph. 983a 33, 985a 12, 988a 22, & 993a 11, it is to the account in the Physics that he refers his readers as the place where the doctrine has already been formulated; he also remarks that it arises most naturally in its place in the Physics.

46). Phys. 11 7 198a 18

47). Phys. 11 3 194b 28; Metaph. V 2 1013a 28

48). Phys. 11 3 194b 28; Metaph. V 2 1013a 29

49). Metaph. V11 8 1033a 33-1033b 18

50). Phys. 11 3 194b 27-8; Metaph. V2 1013a 28

51). Phys. 11 3 194b 24-5; Metaph. V2 1013a 25-26

52). Phys. 11 3 194b 30; Metaph. V 2 1013a 31-2

53). Phys. 11 3 194b 33-4; Metaph. V 2 1013a 33-4

54). Phys. 11 7 198a 20

55). Mysticism and Logic p193

56). Ibid p. 187

57). Ibid. p188

58). Ch 8

59). p.158

60). Phys. 11 3 195b 4-5, 17-18; Metaph. V 2 1014a 10, 20-25

61). Phys. 11 3 195b 5 18-20; Metaph. 11 2 1014a 9-10

62). Langley's machine, though not flown successfully till 1914, was completed in 1903, the year which saw the completion of the Wright brothers' first successful model.

63). Ch 1 p 76

64). p.182

65). p.189

66). pp.159, 162

67). Phys. 11 7 198a 27; Metaph. 1070b 31-4; De Gen. An. 11 4 740b 25-39.

68). Sect iii pp.213-223

69). Logic 111 Ch V11

70). Sect iii (f) pp223-6

71). Logic 111 Ch. V1 pp.71-2

72). Ibid. Ch. V11 p 78

73). Ib. pp82-3

74). Ib. p92 & Ch 1X

75). Ch. 1 pp85-6

76). Phys 11 7 198a 27;

77). Phys. 11 3 194b 28; Metaph. V2 1013a 28

78). Metaph. V11 8

79). De Generatione Animalium 11 4 740b 26-29

80). Phys. 11 3 195b 224

81). Metaph. 1070b 34

82). Cf. Phys 11 4, 5 & 6

83). De Gen et Corr. 11 9 335b 8

84). Phys 11 7 198a 20

85). De Motu Animalium 1 & 2

86). De Mot An 2 698b 15 698b 11

87). 740b 26-9

88). Phys. 11 8 199b 26

89). Ibid. 199b 27-9

90). Phys. 11 8. 199b 30

91). Cf. The Monadology

92). Cf. his contribution to the Symposium on Mechanical and Teleological Causation in the Supplementary Proceedings of the Aristotelian Society for 1935 (vol.X1V)

93). pp217-8

94). Phys. 11 8

95). Phys. 11 4 & 5

96). Phys. 11 5 196b 24-9

97). Phys. 11 5 197a 15-8

98). Ibid. 196b 18-9

99). Sect. iii (b) pp.183-193

100). For an account of the influence of Aristotelian notions on seventeenth centry thought see chs. lll & lV.

101). Cf. Phys. Vlll 3-6; Metaph. Xll 6

102). It is true that (in Metaph.Xll 6 1072 4-11) Aristotle describes God as 'final cause' insofar as he regards Him as moving solely by being desired. But it is clear that the role he ascribes Him is also analogous to that of an agent in that He is regarded as a continuant 'causing' change in something other than itself. The truth of the matter is that in God and in God alone, Aristotle really 'identifies' 'final' and 'efficient cause' in the ordinary sense of the term 'identify'.

103). pp. 174-7

104). pp. 204-7

105). Phys. Vlll 6 258b 30, 259a 4; Metaph. Xll 6 1072b 4ff

106). Phys. Vlll 6 258b 11, 259a 4,14, 259b 24 260a 1, 14, 16, 9 266a 9, 10, 10 267b 4, 16, 18, 23.

107). Kritik of Pure Reason (tr. N.K.Smith, Macmillan 1933)pp 409-11

108). The Philosophy of Leibniz (Allen & Unwin 1949) Ch XV Sect. 109 p175.

109). Russell, it is true, at one time (Cf.Mysticism and logix p 193) denied any ground for the common supposition that a 'cause' determines its 'effect' in any sense in which the converse is not equally true. But he did so because he supposed 'causal' assertions a misleading form of stating complex regular correlation, which could be expressed by describing one variable as a function of others. But clearly, once again this view does not exonerate him from ignoring the significance of the distinction in the arguments of those who recognise it.

CHAPTER III

THE ROLE OF ST.THOMAS AQUINAS IN THE DEVELOPMENT OF THE USE OF THE TERM CAUSE AND OF THE NOTIONS ASSOCIATED WITH IT.(1)

St.Thomas Aquinas plays an important, and indeed unique, role in the development of the use of the term 'cause', and of associated notions. For so well did he champion Aristotle against ecclesiastical criticism, that he ensured European philosophy being basically Aristotelian during the succeeding three centuries. Owing to the influence of the Church at that time, St.Thomas's final success in converting ecclesiastical oppostion to Aristotelianism into benediction, gave him an unparralleled role in the history of thought, placing him in the strange position of being a dominant influence in the thought even of those who seem to have had no direct knowledge of his writings. Thus, to take a notable example, it seems unlikely that Descartes would have framed the argument for the existence of God found in his third Mediatation had not St.Thomas won general acceptance for the notions underlying it, yet there is no evidence that Descartes was familiar with St.Thomas's own writings, appearing instead to have derived his knowledge of Scholasticism mainly from Suarez who was a far cry from St.Thomas.(2) Indeed, the way in which Descartes, while supposing himself to have made a clean break with the past, yet took for granted notions intrinsic to Thomism, is startling evidence of the extent of the latter's influence.

St.Thomas's influence on seventeenth centry rationalism was twofold. On the positive side he was responsible for its exponents taking for granted many notions fundamental to much that they wrote, and on the negative side he influenced the direction of their thought in so far as his philosophy coloured the background against which they reacted; prompting them for instance to concentrate on spheres of thought which it had neglected or to which its methods were inadequate, such as mathmatics and scientific research respectively.

I have said, as indeed is commonly accepted, that St.Thomas's influence was responsible for making European thought predominantly Aristotelian from the thirteenth till the seventeenth century. It might, therefore, be imagined that he was but a mouthpiece of Aristotle, whose only claim to innovation lay in his expressing Christian theology in terms of Aristotelian philosophy. But this view is unjustified, for not only did St.Thomas differ from Aristotle on occasion, more often elaborating, modifying, or putting fresh emphasis on, various Aristotelian notions; but, it seems to me, it is precisely this modified, developed, and reorientated Aristotelianism which proved so far-reaching an influence. Nor indeed are Aristotelianism and Christian theology the only influences apparent in St.Thomas's writing. The Neo-Platonic conception of existence as hierarchical and the Augustinian statement of the problem of evil, were both important, not merely as factors in the formation of St.Thomas's thought, but also among the notions which his influence contributed to non-Scholastic seventeenth century thought.

The most significant difference between the Aristotelian and Thomistic conception of 'causation', is one which would have been demanded by St.Thomas's theology, although it might have rested on purely philosophical grounds. This lies in the difference between the Aristotelian and Thomistic views of God's role as 'cause'. Aristotle, as has been seen, regarded God as ultimate or first 'cause', not of the existence of the phenomenal universe, but of the changes within it. His role is thus conceived as somewhat analogous to that ordinarily attributed to the atmosphere, whose existence is regarded as a necessary condition of the successions of generations on this planet, but is not thought relevant to the existence of the chemical elements held capable of constituting an organism. For Aristotle, therefore, the role of 'causation' in explaining change, lay simply in showing how new specific characters came to be conferred on already existing 'matter'. To St.Thomas, on the other hand, (who, like Aristotle regards change as occurring in a persistent subject), not only the occurrence of change, but the existence of that which changes presupposes the existence of God as its explanation. And moreover, not only does he treat the term 'cause' or its synonyms as applicable to God as ultimate 'cause' of change, (3) but applies it to him equally with reference to his role of creator in the absolute sense. (4)

The Thomistic position, indeed, seems more consistent with one of the basic tenets of Aristotelianism that does Aristotle's own

It was seen that both Aristotle's interpretation of change, and his denial of an infinite 'causal' regress, require the postulation of universal explicability for their justification (5). But if this is so, then not merely changes and the things they may be said to bring into existence, but also the basic material constituents to which these are reducible, must be explicable in terms of some condition intrinsic or extrinsic to themselves on which their existence is dependent. In Aristotle's view these basic constituents are the 'four elements' - fire, air, water, and earth; and although he may explain the coming into existence of any one of these in terms of the transformation of one or more of the others, this still leaves unexplained why, or how, there ever existed any element to be transformed into another. If, therefore, he supposed the existence of 'matter' ultimately required no explanation outside itself, Aristotle, were he to have been consistent, should have postulated a basic material the condition of whose existence lay in itself. Clearly this could not have been pure 'matter' which would be mere potentiality (and hence has been seen to be a mere logical abstraction), and so would have to be either one of the 'four elements', a possibility which he explicitly excludes, (6) or else a basic element common to them all (a notion which he clearly dislikes). On either view, however, it would have to be regarded as constantly changing (since Aristotle supposes the elements constantly transmuted one into another). And this would seem inconsistent with the condition of its existence lying in itself. For if X, in any given state, is such that it

cannot but exist, its being in any other state would seem to be thereby excluded. Were this not so, however, Aristotle would seem to be involved in contradiction by postulating a self-explanatory basic element of the universe. For if a changing existent could contain in itself the condition of its own existence, this must be the condition of its changeableness otherwise it would not serve wholly to explain the existence of such an one. To say that as subject to change it requires a source of its changes external to itself (as Aristotle maintains), would thus be not merely superfluous, but contradictory. If, therefore, Aristotle could maintain the eternity of 'matter', his argument for the existence of God as prime mover would fall to the ground. St.Thomas's divergence from the Aristotelian position in this respect, thus serves to bring out the implications of Aristotle's premises. That St.Thomas realised this, is indicated both by his use of a form of the cosmological argument to prove God the 'cause' of the existence of everything other than himself, (7) and by the first of the arguments in the Summa Contra Gentiles which he directs explicitly against the Aristotelian postulation of the eternity of 'matter' (8).

The application of the title 'cause' to God in respect of his creative role is extremely significant; for whereas Aristotle's application of it to Him as source of change, precludes its definition in terms of any real, or supposed, phenomenal dependence; St.Thomas's usage precludes its definition on the analogy of any such dependence, if the analogy is regarded as precise enough to

give any insight into the relation beyond its involving dependence. It was seen that, in 'the existence of atmosphere', we experience a factor which may be regarded as a persistent condition on which series of changes distinct from it, depend. But as has been seen: (9) though, if all change be not attributed to continuants and universal explicability be assumed, there are phenomena which must be interpreted in terms of creation 'out of nothing', we have no idea how such creation might take place or of its precise nature.

To my mind St. Thomas's most important contribution to the development of the usage of the term 'cause', was probably quite unsuspected by him. For it seems to me that the conception of the creative God as the 'Cause' par excellence, which is fundamental to his whole philosophy, played no small part in developing that attitude to which a 'cause', properly so called, is essentially a 'maker' or producer. And that St. Thomas was himself unaware of this tendency in his thought, or at least of its full force, is indicated by his zealous adherence to the Aristotelian fourfold classification of 'causes' in contexts other than that of creation (10) to which it is obviously inapplicable. Yet at the same time he betrays this influence in his own thought, since often, when using the term 'cause' without qualification he clearly intends the Aristotelian 'efficient cause' (11). It is true that he explicitly gives pride of place to the 'final cause', describing it as the 'cause of causes' (12) But at the same time he

attributes this primacy to it in virtue of its role as prompting an agent, so that he is even then regarding agency or productivity as fundamental to 'causal' explanation as a whole. The view that the emergence of the definition of 'cause' as producer, owed not a little to St.Thomas's rendering the notion of God as creative 'cause' fundamental to the philosophy of succeeding centuries, is (to my mind) supported by its appearance in the writings of Locke (13) a thinker who, despite his explicit criticisms of Scholasticism, (14) yet betrayed its influence in more than one aspect of his teaching, as for instance in his conception of natural law, (15) and his attribution to 'causes' of intrinsic ability to produce their 'effects'. (16).

I am not suggesting, of course, that St.Thomas was peculiar among Christian philosophers in regarding God as creative, but merely that the role and description of the doctrine in his philosophy had an unique opportunity of influencing subsequent thought and usage. Nor do I mean to deny that the birth of modern science regarded, as it undoubtedly was by its originators, as the search for laws exemplified in the behaviour (and hence the interaction) of bodies, was at least equally important in encouraging concentration on 'efficient causation'.

It should perhaps be remarked in this context that St.Thomas's concern to discuss God much more fully than did Aristotle (and in particular the importance for him of discussing what was meant in attributing will to God, and regarding his 'effects' as willed by Him), provided him with more contexts than had Aristotle for

postulating reasons which could not properly be called 'causes', on the Aristotelian definition. Thus, for instance, he supposes it correct to say that A's being the means by which God wills to achieve an end, makes it correct to describe this as the reason for God willing A. And since he held that no process can be attributed to God's willing, and no complexity ascribed to Him at all; St.Thomas argued that his willing the means cannot be said to be 'caused', either by his willing the end or by his willing to achieve it thereby, as the reason is in fact indistinguishable from that which it explains. (17) This increased opportunity for postulating reasons which are not 'causes' seems not without significance, since it must have served to emphasise the distinction and familiarise philosophers with it, so making them more prepared to reduce the number of reasons to which they applied the title 'cause'.

Equal in historical importance to God's creative role in his system, is St.Thomas's modification and development of the notions contained in Aristotle's treatment of 'final causation'.

Since St.Thomas postulates a creative God, logic combines with theology in demanding his regarding the content and structure of the universe as deliberately designed for the achievement of an end, and that as adequately as may be. St.Thomas, therefore, unlike Aristotle is justified, and indeed obliged, to regard 'final causation' as determining natural processes in other than a merely definitive sense, and hence as providing a principle to which natural or mechanical necessity is subject. Had not St.Thomas ensured teleology being generally understood thus, it seems unlikely that its acceptance or

rejection would have presented the vital question which it did for seventeenth century thought in general.

It is not only in making teleology a vital question that St.Thomas's treatment of the subject influenced seventeenth century thought. In making explicit the implicit Aristotelian view of natural processes as the fulfilment of an inherent tendency to achieve a perfection, (18) St.Thomas made current the notion fundamental to both Spinoza's concept of conatus and Leibniz's idea of appetition. Moreover, his treatment of willing, and voluntarily seeking to attain a desired end, as an instance of such a tendency (19) suggests the Leibnizean view of voluntary endeavour as an instance of the appetition found, differing in degree only, in all monads. St.Thomas's concern to defend the postulation of free will, however, prevents him from asserting so rigid an analogy between natural and voluntary tendency as does Leibniz. Instead, he reconciles the two notions by maintaining (20) that while the will naturally seeks some good, it may choose between seeking a good which cannot be achieved without sacrifice of a greater good (which to him is what evil choice consists in) and one of which this is not true. (Conditions necessary for reconciling the assertion of free-will with the conention that only the desirable is willed, were noted above).(21)

St.Thomas's treatment of evil and its explanation, together with the Aristotelian notion of the 'efficient cause' as conferring an actuality and the Neo-Platonic conception of 'reality' as hierarchical, combined to produce the view of 'causation' fundamental to Descartes' argument for the existence of God, appearing in his

third Meditation. And, as I suggested at the outset, it seems highly improbable that he would have regarded the truth of its implications as 'manifest by the natural light' (22) had St.Thomas' influence not made it fundamental to European thought.

St.Thomas, having defended God's role as ultimate source of all existence, was faced with the problem of evil in an acute form. For if evil could be said to exist then God would have to be regarded as its 'cause', a position clearly anathema St.Thomas's theology. He took the only course open to him in regarding existence as essentially good, and evil as essentially negative.(23) Thus, he maintained that what is ordinarily called the existence of some evil, is in fact the existance of some good which yet lacks, or excludes, the existence of some perfection.(24) From the historical point of view the importance of this doctrine lies in the identification of good or perfection with existence or actuality(so that a thing is said to 'be' or to have 'actuality' insofar as it is supposed to constitute the existance of some perfection), and the conception of a 'cause of existance or being' as essentially the 'cause' of 'actuality' in the sense of the existence of a perfection or good. When this conception is combined with the Neo-Platonic belief in degrees of existence (a belief doubtless suggested by differences such as that between the abilities of various types of organism, or members of the same species), and the Aristotelian conception of the agent as conferring its 'effects' actuality', the 'efficient cause' is conceived as a specific degree of perfection which it must, in consequence, first possess. This conception is

reinforced by St.Thomas's view of creative and generative impulse as an extension of the inherent tendency towards perfection which, the latter having been achieved in the one possessing that tendency, leads it to seek to produce further perfection extrinsic to itself (25) It also provides a possible interpretation of Aristotle's insistence that the 'efficient cause' possesses in some manner the 'form' or actuality which it imparts. Thus, by the combination of these doctrines St.Thomas arrived at the conclusion which Descartes attributed to 'the natural light' - namely that an agent must contain at least as great a degree of 'reality' or 'actuality' as it confers on its 'effect'.(26)

Like many of his successors St.Thomas was presented with a problem in his desire to maintain the freedom of the will. His problem was, however, fundamentally different from that which beset Descartes and Kant. For these latter (as for the majority of St.Thomas's non-Scholastic successors concerned with free-will), the difficulty was to reconcile the postulation of free-will with that of a universe governed by deterministic natural laws. For St.Thomas, on the other hand, the problem was to reconcile the postulation of free will (in man) with the role of God as ultimate 'cause' of all change, and moreover as having ordered the universe intentionally so as to achieve the existence of the greatest amount of finite good possible. St.Thomas meets his problem with the contention that the possibility of a free choice of the highest good is better than an automatic tendency towards it, (27) and that God 'causes' free actions in the sense of making man such as to be able

either to perform them or not. (28) He is able to avoid asserting determinism with 'causation' thus, since - like Aristotle and the plain man - he regards a 'cause' as a necessary condition of its 'effect', but not as entailing it. But since their problems were basically different St.Thomas's discussion of free-will did not influence that of his non-Scholastic successors.

The foregoing indicates that, again like Aristotle and the plain man, St.Thomas supposed neither that everything happens inevitably nor that anything happens at random, supposing all existence consistent with laws of intrinsic dependence. It is further clear that like Aristotle and plain men he supposes there are many processes which always occur under given conditions. But, like some plain men, he supposes divine concurrence always one of those conditions. His conception of an ordered universe therefore, had in it room for miracles, (29) and thus differed from the conceptions of natural order current among many of his successors. At the same time his consistently exchewing the suggestion of randomness and his evident conviction that phenomenal events other than voluntary behaviour must occur under certain conditions (30) rendered his position not wholly at variance with those of later determinists, so that the transition of philosophers from the one position to the other does not represent too startling or fundamental a break.

NOTES.

1. Owing to pressure of space, and to prevent overlapping with the discussions in earlier and later chapters, I am confining my discussion here to what seems relevant to the purely historical importance of the doctrines concerned. Also for the sake of brevity, I merely give the references which seem to substantiate my views, without quoting the text.

2. I base these remarks on what seems to be the opinion of M.C.D'Arcy (Thomas Aquinas Ernest Benn Ltd.1930 pp260-1), but I see Russell quotes St.Thomas as one of the authors represented in Descartes' library (The History of Western Philosophy: Allen & Unwin 1946 p.582) but he does not quote the source of this information. Certainly Descartes' approach to the problem of knowledge reflects the influence, not of St.Thomas, but of Suarez; but of course this need not argue absence of direct knowledge of the former.

3. Summa Theologica Pt.1 Q 2 Art. 3 1st formulation of the cosmological argument.

4. S.Th. Pt 1 Q 44 A 2. Q2 Art 3 3rd formulation of cosmological argument.

5. pp 204-7, 174-6

6. De Gen. et Corr. 11 5 332b 6fff

7. S.Th Pt. 1 Q 2 Art. 3 3rd form of cosmological argument.

8. Summa contra Gentiles Bk 11 Ch.XVl 1st argument.

9. p. 205.

10. Cf S. Th. Pt.1. Q 44 A.2; Summa Contra Gentiles Bk.II Ch.XVI 1st. argument.

11. Cf. S Th. Pt.I. Q.45. A. 1,2,3,5,6,7.

12. S. Th. Pt.1. Q V Art 2 Rep. Obj. 1

13. Essay Concerning Human Understanding (Routledge & Sons) Bkll Ch XXVl p. 238-9

14. Cf. Essay Bk.III Ch.X Sects. 6ff.

15. Cf. Treatise on Government

16. Essay Bk 11 Ch XXI (Of Power).

17. S.Th. Pt.1. Q.19. A.5.

18. S.Th. Q.19. A.1

19. Ibid.

20. Cf. S. Th. Pt.11 (1st. Pt.) Q.5. A.8 Rept. Obj. 3; Q.8. A.1

21. pp.115-7.

22. Meditation 111 (Haldane & Ross tr. 1931) pp.162-3.

23. S. Th. Pt. 1. Q.48 A.1

24. S. Th. Pt. 1 Q.49 A.2. (Cf.especially Rep. Obj. 2)

25. S. Th. Pt 1. Q.19 A.2

26. Cf. S. Th. Pt. 1 Q.49 A. 2 Rep. Obj. 2; Q. 49. A. 1

27. S. Th. Pt. 1. Q. 48 A. 2; Q. 49 A.2

28. S. Th. Pt. 1. Q. 19 A 8

29. For discussion of the possibility of combining the notion of an ordered universe with the postulation of miracles cf. supra pp. 119-24

30. Cf. S. Th. Pt. 11 (1st Pt.) Q.85. A.5. Rep. Obj. 1

CHAPTER lV

CAUSAL NOTIONS OF THE SEVENTEENTH CENTURY RATIONALISTS.

i. The influence of scientific development.

If the seventeenth century rationalists owed many of their assumptions to St.Thomas (either directly or indirectly), the scientific development which took place in the sixteenth and seventeenth centuries ~~were~~ was largely responsible for both the new channels into which these philosophers directed the old ideas, and for their rejecting or ignoring certain other Scholastic notions.

That the birth of modern science, properly so called, took place in the sixteenth century, was no accident. In non-mathematical terms it is possible to express only generalisations so broad as to exclude precise prediction, and hence a science which lacks mathematical formulation leaves room for many more hypotheses which are not empirically testable than one which does not. Thus, for instance, Galileo first mistakenly supposed the rate of acceleration of falling bodies proportional to the distance through which they fall, later justly concluding it to be instead proportional to the time in which they fall. Had it been impossible to express these theories mathematically, it would have been impossible to base on them predictions precise enough for them to be adequately tested empirically. Nor, could Newton then have shown Galileo's conception of gravitational acceleration to be consistent with the movements of the planets when these are computed relative to the sun, and thus provided the first positive evidence in favour of the Copernican hypothesis. The mathematical formulation of principles of dynamics

was thus essential, not merely to the development of dynamics as we understand it today, but also both to that of astronomy in particular and to the formulation of laws conceived as applicable throughout the universe (or at least to the earth and other members of the solar system alike). (1) And it was not till the sixteenth century that mathematics was sufficiently developed to be successfully applied to the description of phenomena other than astronomical. Even in astronomy the most convenient method of computation was not adopted before then, so that the maximum precision possible (without the aid of telescopes) was not obtained. Burtt has pointed out (2) that even here, where advance depended, not on discovering how to apply mathematics successfully to the phenomena in question, but merely on adopting a more convenient method of doing so, it was closely related to mathematical developments.

It is small wonder therefore that the beginnings of mathematical physics have been identified with the beginnings of physics in general, so that Burtt can write (3) that the Medievals were concerned, not with the 'how' of motion (by which he evidently means its scientific analysis), but only with its 'why' or purpose. That Medieval scholars were far from disinterested in what Burtt calls the 'how' of motion, has been amply proved by Duhem's researches, (4) and Koyre's lengthy quotations from Bonamico's De Motu (5) reveal that even a sixteenth century Aristotelian was extremely concerned about the 'how' of motion. It was solely because some of the Medievals were unable, and the others unwilling, to apply mathematics successfully to dynamics that their theories, however ingenious

and hardly won, remained incapable of adequate empirical testing and hence sterile. For so long as it was sufficiently ingenious to account for commonsense experience one theory was as good as another, there being no generally acceptable criterion for the admissibility of any theory, let alone its development.

The Copernican hypothesis, the successful application of mathematics to dynamics, and the conception of all physical change in terms of dynamics, combined to produce the deterministic picture of the universe as a whole, which dominated the thought of the seventeenth century rationalists. For if the earth be regarded, not as the unique centre of the universe, but as one planet among many, then the laws which may be supposed to operate on the earth must be supposed typical of those applicable to the universe as a whole; and if the minutest physical change is mathematically calculable given sufficient data then all change must be necessary, since it is nonsense to describe a mathematical conclusion as sometimes, or generally, true. And doubtless it was the enthusiasm evoked by discovering the possibility of applying mathematics successfully to dynamics, which provoked the conviction that all physical change was reducible to the latter's principles, although these were then capable of verification in a relatively limited sphere.

In general the discovery of the scientific importance of mathematics stimulated the view of the latter as the ideal to which all true knowledge should attain. The role of philosophy is therefore conceived, more than ever before, as the demonstration of certainties. The formulation of a ~~philosophic~~ philosophical method capable of

achieving this aim, thus assumes paramount importance, receiving considerable attention from both Descartes and Leibniz. In particular this ideal, together with the deterministic picture of the universe, gives the notion of a 'cause' which entails its 'effect', an importance which it has never assumed before.

Despite the development of algebra, which made scientific advance possible, mathematics was still generally conceived geometrically in the sixteenth and seventeenth centuries;(6) and this in its turn had an important influence on the current science and philosophy. It seems not unlikely for instance, that Galileo (despite the fact that he freed his conceptions from geometry more successfully than many of his contemporaries) was yet inspired by the thought of a geometry laying down ideal conditions, to conceive a physics which should do the same, actual phenomena having to be conceived in terms of interfering factors provoking deviations therefrom; e.g. the first law of motion which asserts that an undisturbed body moves continuously in a straight line at a uniform speed, although owing (it is assumed) to interference no body is observed to do so. The influence of the predominantly geometrical conception of the all important mathematics is no less significant for much philosophical thought. It is thus fundamental to both Descartes' metaphysics and to his physical notions, and it is equally fundamental to Spinoza's position. The latter philosopher indeed betrays his geometrical ideal of knowledge by setting out the principal statement of his position in the style of a Euclidean manual, as a system of axioms and theorems. And on the other hand, it was his recognition of the

inadequacy of the current purely geometrical conception of the universe, which prompted Leibniz into the extreme reaction of denying that any reality can properly be regarded as quantitative, hence provoking his account of experience with its (for the present subject) all important treatment of apparent phenomenal interaction.

As has been already remarked, (7) the conception of the physical universe as a compact, necessarily determined, system raised serious problems for those philosophers who wished to maintain the freedome of the will. And some of the discussions which this problem provoked, in Malebranche for example, (8) are equally important in the development of 'causal' notions.

ii. Descartes.

(a) The use of the term 'cause' in his metaphysics.

Although the term 'cause' does not occur much in Descartes' writings on physics, these contain notions generally regarded as 'causal', which have furthermore proved important in the history of philosophy. Although these have much in common with the notions underlying his use of the term 'cause' in his metaphysical and epistomological writings, they are not identical; it is necessary, therefore, to deal separately with these two conceptions. I shall deal first with what I may perhaps, for convenience, call the 'metaphysical' notions, as these are most significant historically in linking Descartes with his predecessors, while the physical notions are primarily important in linking him with his successors.

Descartes recognised how disastrous is the uncritical acceptance of inherited assumptions, and indeed succeeded in performing the major operation of divesting himself of the language and methods of contemporary philosophy. Being human, however, he was unable to avoid taking some prevailing notions for granted without due analysis. Despite his unconscious inheritance from the past, however, Descartes' break with the language and methods of his predecessors and his sincere attempt to look at philosophical problems with new eyes, succeeded in making him the father of modern philosophy properly so-called. Bacon, it is true, was critical of the old ideas and methods, but he opposed them very much in their own terms; and Hobbes, though more 'modern' than Bacon

in his general attitude, had not the wide influence of Descartes, nor was his position so systematically defined. Descartes more than any other philosopher was responsible for making current the view of philosophy in general, and of 'causation' in particular, which was the object of Hume's criticism. It is therefore of no mean interest to see the extent to which he was influenced by notions and attitudes, integral to the philosophy whose ascendancy he so effectively challenged.

It has been seen (9) that St.Thomas, apparently unwittingly, prepared the way for the attitude of mind which defines a 'cause' as essentially a producer: Descartes is the first outstanding philosopher to make this position explicit. He differs from his Scholastic predecessors in this respect, not merely in terminology, but also in his denying the utility of seeking teleological explanations. That there are such he does not deny but he maintains that 'we should not take so much upon ourselves as to believe that God could take us into his counsels.' (10) His conception of 'efficient causation' as expounded in the metaphysico - epistemological discussion of the Meditations, however, is basically Thomistic and is defensible, not to say explicable, only on Aristotelian - thomistic principles.

The Cartesian conception of 'efficient causation' is made explicit in the course of the argument for the existence of God found in the third Meditation; or, rather, it is made more explicit here than anywhere else since, as will be seen, its basic presuppositions are not made at all clear, so that it seems completely

inexplicable to one unfamiliar with the medieval ideas whence it derives. The passage in question is very familiar but as I wish to discuss its basic ideas in some detail it seems convenient to quote it in full at the outset.

"Now it is manifest by the natural light that there must be at least as much reality in the efficient and total cause as in its effect. For pray whence can the effect derive its reality if not from its cause? And in what way can this cause communicate this reality to it unless it possessed it in itself? And from this it follows not only that nothing cannot proceed from nothing, but likewise that what is more perfect, that is to say which has more reality within itself cannot proceed from the less perfect. And this is not only evidently true of those effects which possess actual or formal reality, but also of the ideas in which we consider merely what is termed objective reality. To take an example, the stone which has not yet existed not only cannot now commence to be unless it is produced by something which possesses within itself either formally or eminently all that enters into the composition of the stone, and heat can only be produced in a subject in which it did not previously exist by a cause which is of an order at least as perfect as heat. But further, the idea of heat, or of a stone, cannot exist in me unless it has been placed within me by some cause which possesses within it at least as much reality as I conceive to exist in the heat or the stone. For although its cause does not transmit anything of its actual or formal reality to my idea, we must not, for that reason, imagine that it is

necessarily a less real cause; we must remember that (since every idea is a work of the mind) its nature is such that it demands of itself no other formal reality than that which it borrows from my thought, of which it is only a mode. But in order that an idea should contain some one certain objective reality rather than another, it must, without doubt derive it from some cause in which there is at least as much formal reality as this idea contains of objective reality.' (11)

On the basis of this definition of 'causation' Descartes proceeds to argue that our possessing the idea of a supremely perfect being presupposes the existence of such an one, since only thency could the idea derive its 'objective reality'. It is at once evident that this is in fact a novel version of the cosmological argument, resting primarily on the assumption that nothing is inexplicable; for if something may exist inexplicably, clearly there is no need to suppose the existence of either a stone or the idea of one, to be dependent on some external 'efficient and total cause'. The occurrence of Descartes' account of 'causation' in this context is therefore important, since it makes it clear that Descartes supposes his remarks concerning 'effects' to apply to every existent which does not contain the condition of its existence within itself.

As for his predecessors, the belief that nothing is inexplicable is so integral to Descartes' thought that he never makes it explicit. That he, an arch-rationalist should so have taken it for granted, is hardly to be wondered at, however, when it is remembered that even the critical Hume appears to do so when, without comment, he embarks on

a lengthy search for an explanation of our possessing an idea of necessary connection between 'cause' and 'effect'.

Descartes' failure to indicate any awareness of the affinity between his argument and those current among the Scholastics (unless attributed to dishonesty, which would not seem justifiable), is explicable only on the hypothesis that the assumptions he held in common with them were so intrinsic to his thought that he regarded them as axiomatic on any view and, as was suggested above, (12) this hypothesis is supported by his asserting them to be 'manifest by the natural light'.

The Aristotelian and Thomistic roots of the conception of an 'efficient cause' as giving a 'reality' which it must first possess itself, ~~has~~ have been outlined above (13). And it is in accepting this that Descartes aligns his treatment of 'causation' with Scholasticism in particular, since the belief that nothing is inexplicable is common to all rationalists. In order to understand and assess Descartes' 'causal' argument for the existence of God, and the notion of 'causation' on which it rests, it is necessary to ask what he can be supposed to mean by the possession of more or less 'reality' and a 'cause's' giving 'reality' to its 'effect'. To examine what he meant by degree of 'reality' or 'perfection', it is necessary to turn back to St.Thomas as the source and basic influence of the Scholasticism whence he derives the idea. For St.Thomas, different types of existent examplify different degrees of 'actuality', God being the highest and alone fully 'actual'. It has been seen (14) that, in speaking of 'actuality', St.Thomas is speaking, not only of

existence, but also of what exists; i.e. that in speaking of A's 'actuality' he intends to refer to the existence of some thing of a given character. All that he attributes to God, he regards as intrinsic to his nature; whatever he ascribes to Him, therefore, he regards as intrinsic to 'perfection' or 'actuality'. Thus from what he says of God, it is possible to discover criteria of 'actuality' as it has meaning for his system. God alone is 'uncaused', and He alone is the ultimate 'cause' of all 'effects': that is to say God is such that He cannot but exist (since nothing is held to be inexplicable), and every other existent depends on Him insofar as it is the fulfilment of some perfection. From this it is clear that, although simple existence is not identified with 'actuality' for St.Thomas, in speaking of a being's 'actuality' he is saying something very important about its existence. God alone is fully 'actual', and God alone is such that He cannot but exist; while everything else has a derived or dependent existence. The existence of the one is absolute and unchangeable, that of the others conditional. If, therefore, existence is regarded as something completely excluding non-existence, then clearly only God can properly be said to possess it. This is not the normal use of the term existence; but is quite naturally derived from the latter, given the Thomistic conception of God. For St.Thomas, therefore, and presumably for Descartes (his heir so far as the attribution of degrees of reality is concerned), anything is 'actual' insofar as it is independent. Moreover, for St.Thomas and Descartes' God is omnipotent; this for the former means that He is capable of producing any 'effect' which is logically

possible, while for the latter it means that his power is limited by nothing not even the law of contradiction, but for each it means that He has the greatest power conceived possible. Thus for each, He who has the fullest actuality is He who has the most extensive 'causal' power. The ascription of the most extensive power to God, is not of course regarded by either St. Thomas or Descartes as attributing to Him the greatest variety of activities. Man has to use a different activity as he wishes to produce statue, table, bowl, book, etc., since he has to make them by means of physical processes. But God is not held to be so limited; and, indeed, since He is held to be both changeless and completely simple, such multiplicity could not be ascribed to Him without evident contradiction. This serves to emphasise the fact that for St. Thomas and Descartes, unlike Spinoza, to call God 'cause' is to ascribe to Him the production of something external to Himself. To the modern philosopher accustomed to apply the term 'cause' either exclusively, or predominantly, to events, a confusion is possible here which did not present itself to the Aristotelian and his immediate successors, to whom an 'efficient cause' is by definition a continuant.

The correlation of a 'cause's' 'actuality' thus with the extent of its capacity to produce effects, clearly involves the Aristotelian and Thomistic conception of a 'cause' as essentially such as to be capable of producing its effects. If certain 'effects' happen in the past to have been correlated with A's activities, there is no ground for supposing it superior to B on this account; nor if its regular correlation with certain 'effects', though not fortuitous,

was due, not to anything in itself, but to some external factor such as the universe being ordered in a certain manner. But if A is such as to be intrinsically capable of producing more extensive, or more varied, effects than B, this does provide a criterion for regarding the one essentially superior to the other.

This hierarchical conception of existence may, at first sight, seem to involve an unnecessarily complicated usage, which is a far cry from everyday experience. Yet it has in fact a counterpart in commonsense usage. Whether the commonsense usage derives from the philosophical notion, or originally helped to suggest the latter, I do not pretend to judge. But since the commonsense usage is familiar, while the philosophical has grown strange, a brief survey of the former may help to throw light on the latter. The plain man does not speak of degrees of 'reality' or 'perfection', but he does refer to 'higher' and 'lower' forms of life. Thus the caterpillar is commonly regarded as a 'higher' form of life than the cabbage, while at the same time being a 'lower one than man. Clearly, in holding this the plain man does not suppose a caterpillar more alive than a cabbage or less alive than a man, in the simple sense in which any particular organism may be said to be alive or half dead. In this sense, a man who was half dead would presumably be less alive than a healthy caterpillar, while a sick caterpillar would be less alive than a healthy cabbage. The difference between these species, which is normally regarded as the criterion of 'higher' or 'lower' life, would seem to be precisely that which St. Thomas regards as the criterion of greater or less 'actuality', namely degree of independence and extent of power. It

has been seen that, like Aristotle, St.Thomas and Descartes, the plain man regards cabbages, caterpillars, and men as continuants, to whose natures capacity to produce certain 'effects' and perform certain actions (if these are differentiated), is intrinsic. That is to say, they suppose 'Caterpillars can crawl, but plants cannot' to assert that while the former type of existent has a character which enables it to perform a certain activity, the latter has one which precludes its doing so. Furthermore, greater 'power' means greater independence. Thus if A is intrinsically incapable of either moving itself or voluntarily stimulating others to move it, its being here or there is completely dependent on something outside itself (if it is to be regarded, as the plain man would regard it, as dependent on anything); but if its power is not so limited, at least one condition contributing to its being here or there can lie in itself.

The distinction between 'higher' and 'lower' forms of existence was, indeed, upheld by so recent a philosopher as Spencer, who viewed the history of the universe as a gradual evolution of the 'higher' from the 'lower'. His explicit criterion of 'height' is different from that of St.Thomas, since for him the highest existents are the most highly complex and differentiated; whereas for St.Thomas although (owing to the inherent limitations of the physical), within the universe the higher existents are inevitably the most complex, God, the highest existent, is completely simple. Nevertheless since, the more complex physical organisms are those which could be regarded as having the greatest variety of powers, his 'higher' and 'lower' organisms in fact coincide with those so regarded by commonsense,

St.Thomas, and Descartes. Today, of course, if a philosopher wished to regard a man as a higher form of existence to an atom, while at the same time correlating such superiority with more extensive power, he would have to justify preferring the greater variety of 'powers' attributable to a man as such, to the far greater capacity for destruction, heating, etc. attributable to an atom as such. He would not, however, be faced here with a problem different in principle from any which the Thomistic-Cartesian conception encountered; for this clearly preferred the greater variety of powers attributable to man, to the greater capacity for pulling and crushing attributable to an ox.

It seems indubitable that it was the conception of wider power as the criterion of greater 'reality' or 'perfection', which Descartes inherited. For not only is it a conception which he might have derived either from Scholasticism or commonsense, so that the combination of both influences on his thought would be more than enough to account for his taking it for granted; but it seems to provide the only interpretation which makes his argument intelligible. For then its basic premise means simply that every 'cause' must be intrinsically capable of producing the same type of 'effect' as are its 'effects'. This would mean, for instance, that one intelligent being can only be produced by another, that the finite cannot produce the infinite, that the illiterate cannot teach reading. It is then, a conclusion entailed by the Aristotelian conception of the 'efficient cause' as intrinsically such as to be capable of producing its 'effect'. For this means that if A is the 'efficient cause' of B,

and B of C, A is intrinsically capable of producing that which is such as to produce C: in other words A is intrinsically such as to produce its 'effect's' 'effect', at least indirectly, so that capacity to produce C enters into its complete definition. The conception of 'causal power' as inherent in an agent's character, is of the utmost importance to Descartes' argument in another respect. For unless one can say that an agent's possessing a given character is indispensable to is producing a certain 'effect', one cannot maintain that the existence of something of character X presupposes that of an agent of character X.

Before leaving the subject, it will be well to consider more closely the notion of an agent as conferring a power it possesses itself; since its entailment by the Aristotelian principle, though it may serve to explain its acceptability to one brought up on Aristotelian principles, does not serve to make the conception comprehensible to the modern mind accustomed to an entirely different line of thought.

The phenomenon ordinarily called 'giving' is understandable enough: one person passes to another something which he himself previously possessed. It is essentially the transference of something from one person to another, and therefore it is clearly impossible for A to 'give', in this sense, what he does not first possess. Clearly I cannot give away apples or cakes if I have none to begin with. The analogy between A giving B an apple and A producing B, however, is not immediately apparent. Even if one supposes that the agent makes the 'effect', and thus makes it what

it is; it is not at once apparent in what sense it could be said to give it its character, and hence (for Aristotle and those sharing his view in this) its power. The only apparent analogy between the two, lies in the fact that just as B did not possess the apple before A performed the action of giving, so neither did it possess character or power before A performed the action of producing. And a difficulty at once presents itself, since clearly there was no B to be given character or power before A did this producing. So long as the production is of the type considered by Aristotle, namely that consisting in making something from an already existing substratum, not only may the difficulty be avoided, but the postulation of the analogy is readily comprehensible. For then all production is conceived as consisting in giving a character to something already existent. But both St. Thomas and Descartes hold God both to be the agent par excellence, and to have produced all other existents 'out of nothing' - i.e. that whereas there was at first nothing beside Himself, He caused something distrinct from Himself to come into existence. In this instance, 'giving' seems a less appropriate term since the analogy with the ordinary use of the term breaks down. It seems probable, therefore, that it was the Aristotelian usage, or consideration of the types of production Aristotle discussed, which originally suggested the conception of agency as 'giving'.

There is a further serious difference between 'giving' in its most usual sense, and divine agency as conceived by St. Thomas and Descartes. The act of giving an apple, as pointed out above (15) is essentially a process of transfer, so that A cannot give B an apple

while himself retaining it; but both St. Thomas and Descartes hold God's perfection and power incapable of diminution, and hence must have thought that He could give perfection and power to his 'effects' without losing any of his own.

The popularity of heating as an example of 'efficient causation' analogous to that ascribed to God, throws light on the conception and its origin. The Scholastics and Descartes clearly have in mind examples similar to the following: A places a kettle of cold water on a stove, and if the stove is hot both kettle and water become heated also, whereas if the stove is cold they remain unchaged; again if hot water is poured into a cold teapot or cold water is poured into a hot kettle, teapot or water respectively, becomes warmer. Here the analogy with 'giving', in the commonest sense, is close. Kettle, water, and teapot, not only lack heat before contact with stove, kettle, or water, respectively, while possessing it afterwards; but gain heat after such contact, only if that with which they come in contact itself has warmth. Moreover these examples may be regarded as an agent's giving a power which it possesses itself, since not only does water itself become hot after contact with hot stove and kettle, but it is then able to warm something else - a teapot for example. Indeed the analogy with 'giving', in the simplest sense, might have been thought sometimes too close for there to be an analogy with divine agency as well. For sometimes when a cold object comes in contact with a hot one, not only does the former become warmer, but the latter also becomes colder;. Thus for instance if a hot teapot is stood on a cold tile, not only does the tile become warmer, but the teapot becomes

colder. Descartes and the Scholastics would doubtless have answered any contemporary objection to their example on this score, by appealing to the natural belief, supported by experience, that whereas a hot body not containing, nor in contact with, a source of heat naturally cools, a cold one does not naturally grow warmer. They would doubtless have argued that a hot jug grows colder on contact with a cold tile, not because it loses heat in conferring it, but because it has no natural source of heat in itself and so begins to cool as soon as removed from contact with anything hot. And they would doubtless have supported their citing heating as an example of 'giving' which does not involve loss to the giver, by pointing out that a fire, while maintained, willheat anything in proximity to it without itself growing colder and thus lessening its own power to heat. (I am suggesting a way in which they might have defended their example against contemporary criticism, in commonsense terms, since they could have supported it only by appeal to experience as known to commonsense as no science of thermodynamics, in the sense in which this is understood today, was known to them).

St. Thomas cites (16) another example, namely teaching, to illustrate his meaning in describing God as 'giving' reality to his 'effects'. This is much easier to discuss today than the former example, since it is no longer possible to discuss phenomena of heat and heating so as to show whether or not the analogy holds, and is illuminating, without entering into the technicalities of thermodynamics. Even on the commonsense level it presents a simpler analogy. For if all types are to be covered, heating cannot be

defined as the conferring of a quality of warmth possessed by the giver, but only as the giving of a power of heating so held, whereas if one confines oneself to deliberate teaching it is possible to describe it simply as the giving of knowledge already possessed by the giver.

The teacher clearly has to possess the knowledge he intends to impart to his pupils: I cannot start teaching Latin or mathematics unless I myself understand them, nor indeed can I consciously possess anyone of the knowledge of the time the next 'bus goes, unless I already have it myself. But I do not lose the knowledge which I give thus. I may teach Latin all my life without losing the knowledge of it myself, indeed I am more likely to retain that knowledge if I spend my life giving it to others than if I do not use it; and similarly I do not lose the knowledge that the next 'bus goes at 3.30, because I have passed it to my neighbour, nor is my knowledge even lessenèd by my sharing it thus with him. Clearly if God 'gives' reality or power as a teacher 'gives' knowledge, He can be supposed to retain his own 'reality' or power undiminished in the giving. One cannot accept this analogy without further examination, however. One must ask why it is that one form of 'giving' involves loss to the 'giver', while another does not. It will then be possible to understand what St.Thomas and Descartes can be supposed to mean in ascribing 'giving' of the former type to God, and whether they are justified in so doing.

A little consideration shows that the distinction rests on the character of the thing given. An apple cannot be possessed wholly

by two people; either it must be divided so that each has a part of it, or one must possess it as a whole while the other does not. This is because ownership, where physical objects are concerned, is a social convention allowing a person the right to do certain things with them. For example, to own an apple is to have the right to eat it or keep it, to put it here or there; but it is not to have the right to poison it and then offer it to someone else, or to throw it at someone's rare plants or delicate ornaments. It is at once apparent that the rights which ownership of an apple involves cannot belong wholly to two people at once, since an apple can undergo only one physical change at a time. Thus for instance, two people cannot have the right to eat all of it, since it can only be eaten once, and A's eating it precludes the possibility of B's doing so, as it and each of its parts, once completely transformed as in being eaten, cannot reassume its former character again. Similarly, A and B cannot both have the absolute right to move an apple as they wish, since their wishes may not coincide, and an apple, if it remains undivided, cannot be in two places at once. When the discussion is confined to ownership of one apple, these points may seem frivolous, as we are not normally concerned over the rights of ownership of a single apple; but they clearly become of paramount importance when a whole crop of apples is concerned.

With knowledge, however, the situation is completely different. In the first place, though it is sometimes legitimate to speak of the right to use knowledge in a certain way, the possession of knowledge is not ordinarily conceived in terms of possessing certain rights.

More important than this, the nature of knowledge clearly precludes the need for conceiving its 'possession' in terms of exclusive rights. It is not a physical object which must be either here or there, and cannot be shared without division: spatial descriptions simply do not apply to it at all. There is therefore no reason why as great a number as have both opportunity and ability to acquire any given knowledge, should not possess it in its entirety.

Fantastic as the suggestion may appear at first sight, therefore, it is clear that there is a common phenomen which may be, and often is, described as A's giving something to B, which does not preclude A's retaining that which he may thus be said to give. And it is further evident that 'actuality' or 'reality', in the sense of character or power as conceived by Aristotle, St. Thomas, and Descartes, resembles knowledge in that it may be shared without being divided, and so might be'given' in a similar sense. The possession of a character is not such as to confine it to one existent, unless the character in question involves uniqueness; and it is sufficiently evident that most of the characters we distinguish (e.g. roundness, brown-ness etc.) are in fact shared by many existents (whether we regard these latter as sense data or continuants). And since for Aristotle, the Scholastic, and Descartes, an agent's capacity to produce a given effect is inherent in its character, it is reasonable for them to suppose this may be shared as the latter is. And they might have pointed to teaching once more for evidence of the possibility of 'giving' power in this way. For instance, a sculptor may make a pupil into a sculptor, thus giving him the ability to make statues,

without losing that ability himself. The characters and powers which Descartes and his like minded predecessors ascribed to created things do not involve uniqueness; nor did they suppose them to. They were, therefore, justified in supposing God could give these powers to his 'effects' without lessening his own.

It is unfortunate that Descartes did not make it clear that he was identifying degree of 'reality' with extent of power, in his argument. For not only does the contention that a 'cause' must equal its 'effect' in 'reality' seem defensible only on the ground of this identification, in conjunction with the Aristotelian conception of the 'agent' as essentially such as to be able to produce its 'effect'; but on any other interpretation of 'reality' the assertion is palpably inconsistent with experience, since a 'cause' does not always possess whatever it may be said to confer on its 'effect'. Thus that which gives heat is not always hot; I may, for instance, warm my hands, not only by holding them near a fire, but also by rubbing them together; similarly a man with one leg might carve or draw a perfect human figure. But it is always possible to describe such phenomena in terms of the conferring of some power possessed by the 'cause': thus that which is warm can heat and so can friction, so that the latter can be described as conferring the power of heating which it possesses; similarly the lame sculptor could be said both to possess, and to confer on his statue, the power of expressing an idea or of giving pleasure.

Descartes' failure to give 'reality' the only definition on which he could have defended his premise is doubly disastrous, since it

involves a failure to offer any defence of this all important step in his argument. He clearly thought it self-evident, precisely because he took the Aristotelian conception of the 'efficient cause'— as intrinsically such as to produce its effect—for granted. This assumption is not surprising since it was common to his contemporaries, at least insofar as it essential to his argument, so that the need for its defence is unlikely to have arisen for him. But it is precisely this basic premise of his argument which many modern philosophers would question. I shall not discuss it here however, as I have devoted some space to its analysis above,(17) and shall, more appropriately discuss all notions of intrinsic connection between 'cause' and 'effect' more critically below. (18)

Descartes' odd extension of the notion of degrees of 'reality' and equality of 'reality' between 'cause' and 'effect'—to ideas, was evidently prompted by his method of sceptical doubt, which led him to deny the justification of belief in the existence of the external world apart from the existence of God which alone vindicated our confidence in the evidence of our senses when they purported to present us with reality external to ourselves. Descartes' application of his argument to ideas evidently rests on the premise that an idea can only derive from a 'cause' having at least as much power as that of which it is the idea; e.g. the idea of something which can walk must derive ultimately from the actual existence of something capable of walking. There is, so far as I can see, no possible justification of this contention in any sense which would enable it to vindicate the conclusion which Descartes deduces from it. For the defence

on the basis of the Aristotelian conception of agency seems clearly inapplicable, since no actual power of the postulated 'effect' itself is here in question. It seems, therefore, that it could only be defended, if at all, by an appeal to experience; e.g. by trying to show that we could never conceive the possibility of building a house were we neither aware of a possibility of achieving this in ourselves, nor had observed it achieved by others. Such an argument, however, would seem to lead, not to Descartes' conclusion that the idea of God can derive only from Him, but rather to Hume's view that it must derive from the content of our own experiences, i.e. that it can contain nothing we have not actually met with in experience - which is the converse of what Descartes wished to maintain.

His introduction of this questionable principle, and indeed his whole complex argument, was superfluous; since, as has been seen, the existence of God is deducible from his two basic premises; namely that nothing is inexplicable and that something exists. And he could have deduced the existence of a creative God on which his experience depended, from these premises in conjunction with the experienced transitoriness, changeability, and limitations, of his experiences - which would exclude the condition of their existence lying in themselves.

(b) The 'causal' notions inherent in his physics.

As has been suggested, (19) the 'causal' notions inherent in Descartes' physics are neither identical with, nor wholly dissimilar from, those which he supposes to have a wider application. The difference is sufficiently obvious. Descartes thinks that from a given set of physical conditions, a given type of event must follow, so that he supposes the entire history of the physical universe deducible by means of his principles; which is to say that within the purely physical sphere he postulates what philosophers ordinarily describe as 'causes' which entail their 'effects', and no other 'causes'. Yet at the same time, he supposes the existence (and persistence) of the physical universe completely dependent on a 'cause' external to itself - namely God - Whom he thinks free either to produce his 'effects' or not. Furthermore, he also ascribes free choice to human minds. His position may thus be summarised by saying that he assumes 'causality', in the sense of intrinsic dependence, both within and without the physical sphere, but that within that sphere (and within it alone) he postulates one type only - namely intrinsic dependence on entailing 'causes'. He reconciles the postulation of complete physical determinism with his belief in human freedom, by maintaining a dichotomy between mind and matter which excludes the possibility of the latter's being determined by, or rather as a result of, physical laws. But his dichotomy is not absolute, as he supposes the mind capable of affecting the direction, though not the quantity, of certain motions within the body associated with it. It was left to his successors

to make the dichotomy complete. In suggesting distinct determined and 'free'spheres Descartes' position, and still more that of his Occasionalist heirs who made the distinction absolute, foreshadows that of Kant insofar as the latter postulates complete determinism within the phenomenal sphere while at the same time justifying his asserting freedom by ascribing the latter to noumena.

That the 'causation' Descartes assumes within and without the physical sphere may in truth be regarded as two types of one basic generic relation, seems apparent from his detailed discussion of physical questions. All physical change is, to his mind, explicable in terms of the movement of one piece of matter by another. And it is intrinsic to his treatment of such phenomena that A, in moving B, gives it movement and can confer thus no more movement than it possesses (20).

Descartes dislikes the use of such terms as 'power' and 'force', as the medieval discussions had often attributed movement to 'power' or 'force' without any precise definition of those terms (21). It is clear, however, that for Descartes a given quantity of movement is, in effect, the capacity to move a body with a given degree of resistence at a given velocity, so that a body with resistance x moving at y m.p.h. would be said to have as much movement as one whose resistance was 2x and whose velocity was $\frac{y}{2}$. (22) From the scientific point of view Descartes' writings on physics are of no more value than those of Aristotle, for despite some familiarity with Galileo's work, so far as dynamics is concerned, he appears to have derived from the latter's example neither fruitful methods nor sound conclusions. Nor does this

seem attributable to unwillingness to call down condemnation on himself as Galileo's disciple, since he shows cautious preference for the Copernican hypothesis, which was both the occasion of Galileo's fate, and of far less importance to the establishment of the type of view of the universe which he was trying to formulate than were sound methods and conclusions in dynamics.

Koyré has argued forcefully, and in detail, (23) that Descartes' 'geometrisation to the extreme' was responsible for his failure to deal adequately with one particular problem in dynamics, namely the correct formulation of the law of acceleration of falling bodies. And there seems no doubt that the same too rigid adherence to a purely geometrical conception of motion was largely responsible for the general inadequacy and sterility of his physics as such. His conceiving it so, was by no means wholly unscientific in origin, springing largely from the wholly creditable aim, remarked above, of avoiding 'explanations' which, in their appeal to undefined terms such as 'force' and 'impetus' then were in effect, constituted in fact an elaborate cover for ignorance. It has been seen that he did not succeed in excluding all notions of motive power or force from his account of motion, but he certainly endeavoured to frame it as far as possible in terms of spatial displacement alone. (24) The difference between the approach to these problems by Descartes and Galileo respectively, is well illustrated by the fact (also discussed by Koyré) that while the latter, like the former, was led by the predominance of geometrical conceptions into regarding the acceleration of falling bodies as proportional to the distance

traversed, he recognised and rectified his error. It seems clear that Galileo's dynamics was not strangled by his geometrical notions as was that of Descartes, because, (despite his confident affirmation of the deducibility of physical principles without appeal to experiment) (25) he understood, as Descartes did not, the fruitful correlation of mathematical principles with observation. It has been suggested (26) that Galileo's conception of physical principles was probably inspired by consideration of geometry; but in his specific attempts to reach conclusions relevant to the real world geometry was but a tool to Galileo, whereas to Descartes it was always little short of a god. The overweening importance to Descartes of geometrical notions is illustrated in the Meditations, where 'matter' is defined in terms of extension alone. (27)

Despite their scientific sterility, however, Descartes' writings on ~~physics~~ physics are of the utmost importance in that they constitute the first systematic account of physical phenomena as determined by physical laws, framed by a philosopher as distinct from a scientist. (The view was evidently shared by Galileo, since he supposed conclusions concerning physical phenomena mathematically deducible from correct premises). The conception that there must be a strict proportion between the motive power of a mover and that exemplified in, or required to achieve, its 'effect', was not new. It was implicit even in the much decried Aristotelian account of the motion of projectiles, (28) and it was made explicit by St. Thomas (29) and other medieval writers. (30). But no philosopher had framed a systematic conception of the universe in which all

physical change is reducible to such intrinsic and precise correlations. (St.Thomas, of course, could not consistently have held given physical conditions, by themselves, to entail a given 'effect', since he held the voluntary concurrence of a God bound by the law of contradiction to be a condition of all 'effects', whether physical or no). Descartes' relation to his predecessors is epitomised in his attitude to their use of the 'term' 'force'. He condemned this, not because he denied the intrinsic connection between the state of the mover and that of its 'effect' which this implied, but precisely because its use covered a failure to make this intrinsic connection explicit. Just as he sought, in the principle that a 'cause' must have as much 'reality' as its 'effect', a logical ground for the commonsense and Aristotelian belief that all 'effects' are intrinsically dependent on their 'causes'; so, in his analysis of motion(and of all physical change in terms of this), he sought a logical ground for the commonsense and Aristotelian belief that certain physical sequences must occur under given conditions. Doubtless it was the inspiration of the mathematical ideal, reinforced by discovering the possibility of formulating a mathematical physics, which stimulated the desire to show these fundamental concepts of a rationalist view of the universe, to be indubitable.

By expressing the idea that the intrinsic connections commonly assumed between physical events, are basically mathematical, or at least mathematically formulable, Descartes made the conception of such connection not only more explicit, but also more comprehensible

and so more credible. To say that A is such that it must produce B under given conditions is, admittedly, to call B intrinsically inevitable given A under those circumstances, just as much as is affirming mathematicaly formulable principles of movement entailing that A must then produce B. But clearly the latter gives a far preciser picture of the type of relation asserted. It states unambiguously that, just as a mathematical conclusion may be deduced with certainty from the appropriate premises, so might the occurrence of phenomenon B from that of phenomenon A, given sufficient other data. More than this, since at least many physical 'causes' and 'effects' are ordinarily postulated, between which unquestionably we can directly observe no intrinsic connection; the hypothesis that these are all reducible to movements which regularly exemplify certain mathematical correlations, suggests a manner in which they may be intrinsically related, whereas we should otherwise have no idea how this might be. Thus, for instance, as they present themselves to commonsense unacquainted with the findings of classical science, there is nothing to suggest how the successive movements of the moon might be intrinsically connected; but once grant that the first law of motion and the law of gravitation as formulated by Newton may be exemplified in those movements, and it is possible to conceive an intrinsic connection between them.

Moreover whether any particular mathematically formulable law is in fact exemplified by phenomena, it is always possible that evidence may be found supporting the view that one such law is so exemplified. And, indeed, the phenomenal exemplification of such

laws has received experimental confirmation during the past three centuries. The Cartesian conception of physical 'causation' in terms of such laws, therefore, not only makes the conception of intrinsic entailment more comprehensible, but also renders the postulation of intrinsic connection between many phenomena empirically testable whereas it would otherwise not be so. Both Descartes and Galileo (in common with other believers in physical determinism such as Laplace) evidently supposed the existence of such connections demonstrable with certainty; but in this they were clearly confusing the certain truth of conclusions deduced on the basis of their physical principles, given the truth of the latter, with the grounds for accepting those principles—which must ultimately be inductive and hence can confer no more than a high degree of probability. Nevertheless the postulation of a type of intrinsic connection which evidence might at least show to be probable, was certainly an important contribution to the defence of that notion. Descartes' pioneering the idea among philosophers is thus significant in yet another respect.

iii. Spinoza.

In Spinoza's philosophy is to be found both an use of the term 'cause' and a conception of 'causation' ~~not~~ adopted neither by commonsense, nor by any of the philosophers previously discussed.

The distinctive usage has already been remarked: (31) namely Spinoza's describing that containing the condition of its existence in itself as 'causa sui'. It is made explicit in the definition with which he opens his Ethic; 'By cause of itself, I understand that, whose essence involves existence; or that, whose nature cannot be conceived unless existing'. The complete identification of 'cause' with 'explanation' which this represents, is the more significant since Spinoza aligns all explanation with that proper to mathematics, so that the identification means for him that all 'causes' are related to their 'effects' as premises to a conclusion validly deduced from them. Thus although Descartes did much to make the notion of an entailing 'cause' significant and acceptable, Spinoza is the first major philosopher to define 'causation' solely in terms of entailment. He is, therefore, an important figure in the history of philosophy, despite the fact that in most respects his thought had far less influence than that of either Descartes or Leibniz.

The view that all phenomena and their correlations exist necessarily, is a direct corollary of Spinoza's monism. For if, as he holds, all phenomena are but manifestations of the one self-sufficient being, to postulate contingengy within the universe would be to assert that which cannot but exist could, in some respects at

least, be other than it is - an evident self-contradiction. And, in the twentyninth proposition in the first part of the Ethic, Spinoza explicitly deduces determinism, on these grounds, from the monism which he thinks himself to have demonstrated.

The seventh proposition in the second part makes his alignment of logical and physical connection further explicit, and offers a ground for it in Spinoza's monism. Whereas Descartes had distinguished matter (defined as extension) and mind as two types of substance, Spinoza regards them as two among the infinite number of attributes of the one substance. In other words they constitute different aspects of precisely the same thing. To use what is necessarily a very rough analogy, God's relation to the mental and material respectively, is somewhat like that of a certain rock formation near Thirlmere to the outline of a lion and a lamb and that of an old woman playing an organ, respectively - its outline from a distance roughly corresponding to that of the former group when viewed from one side, and to that of the latter when viewed from another. The analogy is imperfect since the observer's role is an important factor in the distinction between the two aspects of the rock formation as ordinarily conceived. Yet at the same time, in saying it appears thus under certain conditions, we ordinarily suppose ourselves to be saying something about the object of our observation; and when we say its appearance is A from this side, but B from that, we do suppose ourselves asserting a distinction which rests, not only on the conditions of observation, but also on the character of that observed.

Now if the mental and the physical are in fact different aspects of the same thing, there must be a precise correspondence between them, just as the rock formation's outline from one side cannot be inconsistent with that from the other e.g. under identical conditions its outline could not correspond on the one side to that of a lion and a lamb and on the other to that of a group of small girls dancing round a maypole. And since, in regarding geometry as the type of all thought properly so called, Spinoza thinks all true connections between our ideas to be necessary, he regards all physical connections similarly. Thus he writes that 'The order and connection of ideas is the same as the order and connection of things' because 'the idea of anything caused depends upon knowledge of the cause of which the thing caused is the effect'. And he adds 'Hence it follows that God's power of thinking is equal to his power of acting; that is to say, whatever follows formally from the infinite nature of God follows from the idea of God in the same order and in the same connection objectively in God.' An illustration he writes 'the circle existing in nature and the idea that is in God of an existing circle are one and the same thing which is manifested through different attributes; and therefore, whether we think of nature under the attribute of extension or under the attribute of thought, or under any other attribute whatever, we shall discover one and the same order or one and the same connection of causes'. (32)

Spinoza's monism has yet another important corollary in his treatment of 'causation' - this is the hitherto undiscussed

conception noted above. For if, properly speaking, there is but one existent, of which all apparent finite existents are but manifestations, then all 'causation' is ultimately immanent since there really are no two existents to interact. Every finite 'effect' thus depends on God, not as an external condition (as it does for Aristotle, St.Thomas, and Descartes), but as that of which it is a manifestation. Spinoza writes that 'God is the cause of his modes not only insofar as they simply exist, (1.Corol.Prop.24) but also (1.Prop.26) insofar as they are considered as determined to any action' (33) i.e. insofar as they are exemplified in given particular manifestations. And again he writes: 'All things which are, are in God and must be conceived through Him (1 Prop.15) and therefore (1.Corol. 1. Prop.16) He is the cause of the things which are in Himself' (34).

This not only represents a conception of natural causation fundamentally different from any considered above, but it also introduces a different usage. For whereas both Aristotle and St.Thomas attribute to continuants, other than God, an inherent tendency to develop in a certain manner, and further attribute the title 'cause' to conditions which are such only in virtue of being constituents of their 'effects'; they normally confine the title 'cause' to conditions of what they regard as instances of production and hence of transient causation.

At the same time, Spinoza is not led by his conception of causation as basically immanent, to deny the reality of the phenomenal connections ordinarily regarded as 'causal', nor even

to deny them that title. It has indeed been seen that, so far from denying the reality of phenomenal relations, he regards them as all having the necessity of geometrical conclusions. More than this, he does not suppose them necessary solely in virtue of the nature of God or reality as a whole, as giving them a certain determinate order. Not only does he suppose finite existents (or rather manifestations of the one existent) intrinsically connected as such, but he explicitly denies that any individual finite manifestation is entailed directly by the nature of God. God is such that he must be manifested in various modes, which latter can be exemplified only in given (apparent) individuals. But each of these finite manifestations of the mode must be entailed directly, not by God's nature or this mode of his existence, but by another of his finite manifestation under that mode. (35) Spinoza's position is thus somewhat analogous to the assertion that the occurrence of movements attributable to a particle, is entailed by the existence of a particle which is such that it must move; while its moving from A to B is entailed, not by this, but by the character of particular movements occurring in its history.

Spinoza, somewhat oddly, even retains the Aristotelian classification of 'causes' although this loses its original signification in his monistic philosphy. He even goes so far as to describe God as 'efficient cause' (36) of his finite manifestations, an usage clearly inconsistent with that of Aristotle, St. Thomas, and Descartes, for whom an 'efficient cause' is always external to its 'effect'.

The monistic conception of the universe, with the 'causal' notions it entails, was not introduced into European thought by Spinoza. The basic conception had been formulated, and its corollaries in the treatment of 'causation' made explicit, (37) in the previous century by Giordano Bruno (whether it had earlier exponents in Europe I do not know). The extent to which he may have influenced Spinoza, however, seems uncertain. And I think there can be no doubt that Spinoza's exposition of the view is the most coherent, and historically the most important, to be found in western philosphy. Indeed, so far as my limited knowledge of the subject justifies an opinion, it seems to be a far better statement of this position than any produced by the east, its natural home.

Despite its coherent and systematic exposition, however, Spinoza's position involves a fundamental inconsistency; for, as has been seen, (38) it is self-contradictory to attribute anything transitory or mutable to a self-sufficient existent, which is in fact what Spinoza is doing in asserting such an one to be manifested in infinite series of finite modifications. But there is no need here to discuss his philosophy apart from its bearing on his treatment of 'causation'.

iv. Leibniz.

Leibniz has been called an eclectic, and it is certainly true that both the principal opposing schools of the seventeenth century - the Mechanist and the Scholastic-contributed much to his thought. Yet, as Russell has pointed out in the very act of using the term, (39) Leibniz was not a superficial borrower; he did not produce a scrapbook, as it were, of cuttings from the work of other philosophers, but rather a harmonious whole. The reason for this seems to lie in the fact that he cannot justly be called an eclectic at all, unless the normal meaning of the term is much qualified He was influenced by opposite schools; but it is truer to say that he constructed his own philosphy in the light of what he learned from them, than that he simply fitted together snippets from their thought. Nowhere is this more apparent than in his treatment of the problems of 'causation'. It seems true to say that no previous philospher penetrated them so deeply. He appears to have been the first to make ~~the~~ explicit the basic alternatives in the interpreation of 'causal' connections when these are not regarded as purely fortuitous conjunctions. This he was probably able to do, precisely because he studied in both the old and new schools. A disciple of one or the other alone, would have been studying an incomplete picture all the time without realising it. And a mere scrapbook collector of cuttings from both sides, would have been equally unlikely to penetrate the question adequately; or indeed to have produced anything like a consistent account of 'causation' at all.

It has been seen (40) that the fundamental difference between the Aristotelians and the philosophers inspired by the new science, lay in their conception of physical explanation. And it was further seen (41) that although Aristotle produced a comprehensive analysis and rationalisation of the commonsense conception of 'causal' explanation, his analysis is totally incapable of providing a basis for either the discovery or formulation of precise natural correlations. It is thus of no use in the formulation of any but the most general predictions. What the Aristotelian said of change was basically true, but he failed to say what is essential to a precise physics. The heralds of the new science, on the other hand, were gradually building up a method of describing and analysing phenomena, which enabled them to detect and formulate the precise correlations discoverable therein. They were thus enabled to reveal an order and regularity in nature undreamed of by Aristotle, and in so doing were able to provide a basis for much more precise and detailed predictions.

It was the recognition that it opened up the way to physical knowledge unattainable by the traditional Aristotelian methods, which led the young Leibniz to reject Scholasticism for the modern mechanism. At that time there were two types of mechanistic theory current. The most popular and influential was that of the Cartesians for whom 'matter' was essentially extension. The palpable inadequacies of the Cartesian analysis (e.g. its faulty treatment and definition of 'force') would probably have prevented Leibniz from accepting it, even had its fundamental premise been less unpalatable to him. It is likely, however, that the same argument

which he was to make the basis of his monadology, (42) namely that the existence of an aggregate presupposes the existence of simple elements to which it is ultimately reducible, was responsible for his adoption of the other form of mechanism current at that time, which postulated indivisible material atoms as the basic elements of which the universe is composed. Since it was the mechanism of Gassendi and Hobbes which he had adopted, it may seem surprising that Leibniz always seems to write with the Cartesians in view. Yet this is readily explicable. In the first place Leibniz' writings were mainly addressed either to individuals who were Cartesians or to those for whom Cartesianism and 'contemporary philosophy' were synonymous. In the second place, Cartesianism was by far the most influential form of mechanism then current. Thirdly, as a result of his stay in Paris and the contacts he made there, Cartesianism must have presented itself to Leibniz as the most vital, vocal, and generally accepted, of current theories. Furthermore, Leibniz' basic argument against Cartesinism - namely the infinite divisibility of the extended, with its consequent exclusion of real extended units and hence of real extended wholes - told equally against the 'matter' of the Cartesians and the atoms of Gassendi.

The need for wholly simple existents, if anything is to exist at all (which it evidently does), is the argument which Leibniz constantly puts forward (43) both as fundamental to his rejection of the theories of Descartes and Gassendi, and as the basic justification of his own view of the universe. According to this latter, (44) its basic constituents are absolutely simple and

therefore unextended; and these simples, or monads, are completely incapable of interaction. (45) Monads other than God, however, are not wholly independent since He brought them into existence, or rather allowed them to come into existence; (46) but they are completely independent of each other.

It might be supposed, on this account, that Leibniz came to reject mechanism, as he had previously come to reject Scholasticism, because he had felt forced to a conception of the universe which excluded it. For what, it might be asked, could be further from a universe, the behaviour of each of whose constituents is entailed by that of others, than one whose basic elements are completely independent of each other. Yet Leibniz' conception of monadic independence is not necessarily inconsistent with the acceptance of a form of mechanism, nor does it seem to have been the source of his rejection of any form of it. I will try to elaborate and justify both these contentions.

Leibniz holds that each simple substance 'perceives', that is to say represents or reflects, the rest of the universe. (47) Only God represents it completely distinctly, the created monads reflecting it with a greater or less degree of confusion. (48) This varying distinction of perception is the sole source of differentiation between substances (49) As there is an infinity of degrees of distinctness, so the collection of monads is infinite; (50) the ~~connections~~ perceptions of each being continuous with those most resembling it (51). This is to say that there is no monad whose perceptions can become clearer without it becoming indistinguishable

from another unless the one nearest to it in the scale of distinctness changes correspondingly. Hence if the monads are to change while at the same time preserving their identity, to a change in one must correspond simultaneous changes in all the rest. (52) Thus, although the states of any one monad are produced by its own inherent activity alone, there is a mutual dependence between the states and changes of any one created monad and those of all the rest, insofar as each is such that its states and changes are correlative with those of all the others. That is to say though the changes in the monad M depend on itself alone so that though all else were annihilated they would continue as usual; yet there is a monad M such that it will change in manner X at time t, precisely because other monads have been created such that they will change in manners X1-----Xn at time t.

Experience does not of course present us with monads directly, since its direct objects are extended. Therefore Leibniz foreshadows Kant in supposing our experience of the 'external world' to be but an appearance or distorted reflection of things as they are in themselves. (53) A phenomenal body is thus a distorted appearance of a number of simple substances. (54) Scientific laws and commonsense clearly assert correlations, not between substances as they are in themselves (on Leibniz's View), but their phenomenal appearances. Further since most of these correlations involve 'physical objects' in the ordinary sense, these correlations are generally between, not appearance of isolated substances, but appearances of collections of substances. Leibniz's interpretation

of the ordinary usage of the term 'interaction' must be understood in the light of the foregoing. One thing, he says, may justly be said to act upon another, in this sense, when in the state or change of the former may be seen the explanation of a state or change in the latter more clearly than in the latter itself (55) In this sense, one monad would be said to act upon another when it reflected the universe in such a way as to show how the order of the whole demanded a given change or state in that other monad, more clearly than did the latters perceptions (56). But the interactions asserted by commonsense are attributed, not to monads as they are in themselves, but to phenomena. If their assertion is to be justified, therefore, the distorted phenomenal appearance to which activity is thus attributed, must likewise reflect the universe in such a way that it reveals the explanation of the state of the phenomenal appearance said to be passive in relation to it. And this relation must hold because the monads, of which each is the appearance, are thus respectively active and passive. Leibniz himself does not make this distinction between monadic and phenomenal interaction, explicit. When discussing interaction in this sense in the Monadology he speaks in terms of monads; but clearly it is phenomena which have suggested this way of speaking, and it is in terms of these that it must be preserved if the judgments of science and commonsense are to be preserved. The foregoing elaboration of his principle is implicit in his explicit discussion of interaction, and his attitude towards the judgments of science and commonsense. It is, in short, the only interpretation consistent with his

conception of the universe, and his attitude to science and common-sense combined.

From the foregoing it is clear that a mechanistic interpretation of phenomena (and hence mechanism in the generally accepted sense since this concerns the relations between phenomena) is open to Leibniz, as it was to Kant, without involving him inits application to substances or things as they are in themselves. He could therefore maintain it without contradicting his denial of actual interaction between monads. Indeed to the post - Kantian it might well seem that the doctrine of the pre-established harmony involves mechanism, for it involves it in the Kantian sense. One has, indeed, only to identify explanation with implication, and physical explanation with entailment, and his interpretation of interaction can mean nothing but mechanism. If to say that the condition of the rest of the universe explains the state of any one monad and vice versa, and to say the changes in the rest of the universe explain those in any one monad and vice versa, is to say that the state of the universe as a whole, and the changes in the universe as a whole, entail the state or changes respectively in any one monad; then the doctrine of the pre-established harmony and the Leibnizian interpretation of interaction plainly assert mechanism. If this is so, phenomena as reflections of reflections of the universe, will also entail each other; and that which exhibits the explanation of anothers occurrence, will exhibit how it could not but have occurred. The existence of one phenomenon will thus be deducible from the character of that which is said to explain it, or to be active in

relation to it; while to an omniscient mind, the whole state of the universe past, present, and future, would be deducible from any one monad or phenomenon, and from any one event, monadic or phenomenal.

But Leibniz does not accept this interpretation. He denies that one phenomenon entails another; he denies that one event, either monadic or phenomenal, entails another; he denies that either the order of monads, or the order of phenomena, is necessary. In other words, he appears to deny mechanism, not on account of his metaphysical theory, but for the reason which led Hume to deny national justification for its acceptance: namely because he could find no ground for postulating entailment as a physical relation. Yet he accepted as certain, not that there was some order among phenomena, but that a given order-namely that affirmed by physics-holds invariably (except for the intervention of miracles which Leibniz admitted but, like St. Thomas, regarded as part of a wider order to which the order of nature is subservient, and hence not as a contradiction of order). Leibniz indeed goes much further than Kant, asserting ~~not only~~ a determinate order, not only among phenomena, but also among the substances, or things in themselves, of which phenomena are the appearance. He even goes so far as to define the nature of this order as consisting in a correlative alteration in distinctness among the monads, which is presumably continuous (though he is nowhere explicit on this latter point).

There are difficulties in this conception, which Leibniz never discusses; and it is not easy to say how he would deal with them.

In the first place, if the imperfect monads' perceptions are

constantly increasing in distinctness, and none of them ever becomes identified with God (a possibility which Leibniz would emphatically deny), the possible degress of imperfect distinctness must be infinite so that there is none between which and that of God no other is possible. But if this is so, every possible degree of distinctness cannot ever be represented in the monads' perceptions as Leibniz explicitly maintained it to be (57).

Even if Leibniz had admitted the incompleteness of the series of actual perceptions so far as their degrees of distinctness are concerned, he would still have been left with the difficulty that his philosophy demands a continuous progression, while experience forces him to admit periodic retrogressions e.g. he has to admit (58) that the death of an animal means an increase of confusion in the perceptions of its dominant monad (or more precisely in the dominant monad in the monad collection of which the phenomenal 'animal' was the appearance). He might however have maintained his teleology, and his conception of the soul, by sacrificing the presuppositions of commonsense, refusing to regard death, even among animals and plants, as retrogressive, insisting boldly that their constituent and dominant monads progress to distincter perceptions through it and after it, although we have no evidence of this. To do this, however, he would have been forced to modify his doctrine of unconscious perceptions, refusing to identify them, as in practice he did, (59) with confused ones, since if sleep or unconsciousness also involves loss of distinctness, the same problem remains. To maintain that sleep and unconsciousness do not lessen

the distinctness of perceptions would probably be psychologically impossible, owing to the ordinary definition of perception in terms of consciousness. In his sense of perception as a representation of the universe, however, Leibniz could consistently have supposed it unaffected by lack of consciousness. But this would involve him in his own difficulties since then he could not regard apperception (in his sense of conscious perception or representation) as a higher form of perception on his criterion, and hence would lose his ground of distinction between the soul and non-rational monads.(60) He could rescue himself, even here, by regarding 'apperception' as specifically distinct from 'perception', and at the same time regarding its periodic possession by a monad as a sign that its perception was of a specific type intrinsically superior to that of those lacking it at all times. If however he thus maintained the continuous series of development among the monads, he would be forced to deny the intrinsic difference between souls and other monads which he wished to maintain;(61) since if both the monad series and the increase in distinctness is continuous, at every moment of change a non-rational monad must be becoming a soul.

It is therefore impossible to state Leibniz's conception of the order of monads precisely; but it can at least be said that he conceived it as the correlation of the continuous alterations in the degree of distinctness in the perceptions of each monad, with the alterations in every other, such that no two monads at any time possess identical perceptions (the differences between the perceptions of the created monads constituting at any time a continuous series).

However obscure in important details Leibniz' account of the order among monads (and hece basically the phenomenal order) may be, of the general character of that order and its implications there can be no doubt. The monads have been so ordered by an inviolable decree or volition on the part of God, that the activities of each will correspond with those of every other. But this cannot but mean that the character of every persistent constituent of, and event in, the universe of monads (and hence also of the phenomenal universe which reflects it) is determined. A has been so constructed that it will change (or act, to be more Leibnizian) in manner x at time t, while B has been so constructed that it will act in manner Y at that time. And so it is with every action in the history of each; and so it is with the character and actions of every monad. But what is this but to say that in fact no event and no monad (and hence no phenomenon), can be other than it is; and so, it may be asked, what is this but to say that everything in the history of the universe (either monadic or phenomenal) is necessary. For what, it will be asked, is the 'necessary' save that which cannot be otherwise?

Yet Leibniz affirms that no such event is necessary, (62) Why is this? The answer is evident: his definition of necessity differs from that assumed above.

A little reflection will show that the term 'necessity is commonly used in two distinct senses, and that Kant was by no means revolutionary in affirming two distinct types of 'necessity'. (This distinction, of course is apart from and independent of the

basic and highly important distinction between 'necessity' regarded as an attribute of propositions and as an attribute of non-verbal existents. This latter distinction is important, since whereas the necessity attributable to propositions or rather their deducibility one from another, is conventional, since it depends on definitions and rules which are in the last resort arbitrary or a matter of choice; that attributed to non-verbal existents or facts is generally not supposed to be of this type but rather to be independent of all choice. Confusion is invited by most of the philosophers of the past who have discussed 'necessity', by the fact that they have often explicitly discussed 'necessary propositions' whereas in fact they were considering not verbal but non-verbal 'necessity'. The distinction may be ignored for the present, however, since Leibniz, Kant, and the man in the street, in expressing the conceptions to be examined below suppose them to concern non-verbal 'necessity'. In speaking of 'necessity' in what follows I shall, therefore, be considering only attributes ascribed to non-verbal existents).

Nor is it unusual to apply different terms to the different types of 'necessity' discussed below. The man in the street distinguishes them as 'logical' and 'physical' necessity, the Scholastics called them 'absolute' and 'suppositional' respectively, in addition to the Kantian use of the terms 'analytic' and 'synthetic' to express what is basically the same distinction. It is not difficult to discover the meanings which have been given to these terms. When St. Thomas says that A is 'absolutely necessary', when Kant says A is analytically necessary when the man/

in the street says it is logically necessary, they mean that it is such that it cannot be otherwise. That is to say they suppose its denial to involve a contradiction, not simply in virtue of conventional definitions or rules of language, but in virtue of the intrinsic character of A. The impossibility would remain whatever language was used, whether there was any language or none; it would be expressible linguistically however, only by a language whose rules and definitions made this possible. Thus if 'God is eternal' is a proposition which is absolutely necessary in this sense, it asserts something which is absolutely intrinsic to a certain character; but there is no connection between the terms 'God' and 'eternal' apart from the characters they designate save only a conventional definition and rule. Other words may be used equally well (e.g. 'Dieu est eternel'), or even 'Electricity is adamant', if these terms have been chosen to designate the same characters). Thus when St.Thomas says God's existence is absolutely necessary, he means that He is such that He cannot fail to exist, that there is a certain character which is such that it cannot fail to be realised by existing. Most of the absolute, analytic, or logical, necessities asserted, concern not existence as such, but the correlation of certain attributes or qualities; they assert, not that A must exist because it is A, but that should any A exist it must have the attribute B since the character A is such that it cannot fail to possess attribute B. For instance, if the man in the street regards 'Man is mortal' (given the normal definition of 'man' and 'mortal') as asserting a logical necessity,

and if the Scholastic had regarded it as asserting an absolute necessity, or the Kantian supposed it to assert an analytic necessity, these would be supposing that the character of being human is such that no one possessing it can escape death; they would be supposing that to be human is to be an organism so constructed that it cannot fail to disintegrate sooner or later. (This, of course, is to assert neither that any of these do so regard the proposition 'man is mortal', nor that they would have been justified in so doing; the question as to whether either of these assertions would be justified is here irrelevant. The example is only meant to illustrate the type of thing they suppose themselves to be asserting in 'absolute', 'analytic', or 'logical' necessity.)

On the other hand, when St.Thomas says that 'A is B' is 'necessary by supposition', he means not that its denial is impossible, in virtue of the intrinsic character of A, but only that its denial is impossible given certain conditions, that under certain circumstances A cannot fail to be B. St.Thomas does not appear to have recognised the full value the conception of 'suppositional necessity' in the pursuit of knowledge; he is not in the habit of using it to obtain conclusions, and the illustration of it which he offers (63) is trivial (granted that Socrates sits it is necessary that he should sit so long as he is sitting). The conception is introduced to show that it is not absolutely necessary for God to will all that He does will, and St.Thomas appears to be interested in it only as it serves that purpose. It is however evidently a

very useful principle, if it can be applied; for if it can be shown that given certain circumstances A must exist or must be in such and such a state, then it may be possible to deduce conclusions about the existence or state of A at a given time, though these are not deducible from its character alone.

The man in the street is using precisely the same principle when he asserts a thing to be physically necessary. Paradoxically he usually does this by asserting its opposite to be physically impossible. No doubt this is because he takes what he regards as physical necessities for granted, and so has only occasion to assert them when they are denied, which occasions naturally provoke a rejection of the denial rather than an assertion of the necessity which contradicts it.

The contexts in which physical necessity, or impossibility, is asserted, and the content of such an assertion are familiar enough. Physical necessity, or impossibility, is normally ascribed to a phenomenon which no one supposes to be absolutely necessary in its own right. For instance it may be asserted that Jones's death within a very short period is physically necessary (or alternatively that his living long is physically impossible). Yet no one supposes that the disintegration of Jones is an event which of its very nature (taken by itself) must take place at a given time (or within two specified points of time which are sufficiently close). It might perhaps be held intrinsically impossible that his death should not have occurred by 1950, given that he was born in 1800; but even this involves, in the date of his birth, a condition which

might not be thought intrinsic to the character of being Jones (though Leibniz would have regarded it so). It would not ordinarily be held that there is any intrinsic contradicition in supposing Jones to die at 4 p.m. January 12th 1955, or in supposing him to be alive after that time. Yet there are circumstances under which it would generally be supposed necessary that he should be dead by that time, or impossible that he should live as long. Thus while there is no intrinsic necessity that Jones should be dead by 4 p.m. 12th January 1955, if he has taken a large dose of arsenic some hours previously and has not since taken an emetic, it is necessary that he should be dead by then. Similarly though there is no intrinsic impossibility in letters reaching me between January 5th and January 10th 1960, it may in fact be impossible that they should do so; this will be so if I should be snowed up in a remote farmhouse between those dates.

From the foregoing it is evident that physical necessity is ascribed to phenomena, not in virtue of their intrinsic natures, but in virtue of the existence of some further condition which is held to entail it. Whether the existence of this condition is in itself necessary or not, or in what sense it might be regarded as necessary, need not be discussed here. The important point here is simply the conditional nature of 'physical necessity'.

It is further evident that although conditional necessity differs from 'absolute' necessity, precisely in being conditional, it does not necessarily involve any basically different form of

necessitation; That a phenomenon is conditionally necessary depends on two things; firstly on the existence of something else (which may or may not be itself necessary); and secondly on some necessary connection between such an existent and that to whose existence it gives necessity. And this necessary connection might well be of the analytic or absolute type. Taking arsenic in sufficient quantity might necessitate the occurrence of death, simply because arsenic is of such a character that it cannot fail to initiate disintegration in an organism into which it is introduced in sufficient quantity. There is no doubt that many philosophers have so regarded the relation the between arsenic and death. This view may be questioned, but need not be discussed here as the problems it involves will be considered below. (64)

The fact that the intrinsic or 'analytic' necessity of relations on which conditional necessities were held to rest, was ordinarily taken for granted by Kant's predecessors, doubtless explains why they devoted so little attention to the latter, which were simply regarded as subsumed under the former and so not needing separate consideration.

Yet as St.Thomas recognised, the distinction between 'absolute' and conditional or 'suppositional' necessity, was of considerable importance to them, precisely because the conditional necessity of the existence or character or anything depends equally on the necessary connection between that existence or character and a given condition, and the existence of that condition ⊖ which latter in its turn may or may not be necessary either absolutely or conditionally.

That the existence of such a condition might not be necessary, was a very real possibility for the Aristotelian and for Leibniz since, like the plain man, they postulated contingent events. Indeed, both the Scholastics and Leibniz held, not only that no existence save that of God is intrinsically necessary, but also that no other existence is entailed unconditionally by his, i.e. independently his freely willing it.

It is evident that unless the necessary condition of A's existing, or possessing a given character, either exists absolutely necessarily itself, or is dependent on an entailing condition which does, there is no fundamental contradiction in supposing it not to exist (or possess that character) since none of the conditions of its doing so is such that it cannot fail to occur. There is, therefore, precisely speaking a strict or absolute type of necessity which cannot be ascribed to objects so conditioned; and it seems clear that when Leibniz uses the term 'necessity', he interprets it in this strict, or completely absolute, sense. Thus when he denies necessity to events, he is not denying the existence of any conditions which entail them; this he not only admits but takes pains to affirm (65). What he <u>is</u> danying is the necessity of these conditions existing. (The postulation of an absolutely necessary existent has been considered sufficiently for the present purpose in discussing the cosmological argument for the existence of God; (66) and clearly the admission that there is anything to which such absolute necessity is ascribable is irrelevant to the present discussion which is concerned only with understanding the Leibnizean definition of 'necessity'.

Leibniz denies necessity to phenomena in this sense because, like St.Thomas and Descartes, he supposes their existence dependent on a free volition of God. It is thus that he is able to reconcile the postulation of the pre-established harmony (and indeed the view of a monad's changes as intrinsic to its nature) with the denial of necessity in either the monadic or phenomenal 'universe'. Given that God wills that a certain monad should exist, this latter must develop in a certain manner; and given that he wills more than one to exist, the principles of continuity and identity of indiscernibles entail that the nature of each shall be such that its changes will be correlated with those of all the others so that each retains its identity. And given that God wills the existence of the present universe, the characters of the monads constituting it (and hence the phenomena which are their appearance) must be determined so. But God was free either to will the existence of the present universe, or not; and He was free either to will the existence of any monads beside Himself, or not.(67)(Leibniz' position here is basically that maintained by St. T homas in the passage referred to above).(68).

It may be questioned whether Leibniz succeeded in justifying this latter contention. It might, for instance be held that, by the conjunction of his conception of God's goodness (69) with his view that existence is better than non-existence,(70) he has suggested that God is such that He would not have failed to create as many existents as possible; and further that he could have created only one universe, since He is such that He could not fail to create the

best of all possible worlds. (70) Leibniz defends his contention that God was really free both to will the existence of something beside Himself or not, and to will that of the present universe or not, by maintaining that ends or purposes incline without necessitating. (71) It has been seen, (72) however, that the acceptance of such an assertion is by no means straightforward, and is indeed admissible only if 'incline' is understood, not in the ordinary sense of prompting, but solely as making something a possible object of choice. Leibniz it must be admitted, went deeply enough into neither this, nor the general problem as to how God can be regarded as a non-necessitting 'cause'. He subjects the latter problem, for instance, to a far less rigorous analysis that does St. Thomas (73) It is unnecessary to pursue these considerations further here, however. That Leibniz supposed himself to have been justified in regarding God as the 'free' cause' of the universe, is sufficient to save him from self-contradiction in both postulating a pre-established harmony and denying necessity to phenomena or created nomands. (The postulation of human free-will, which he also wishes to maintain, appears extremely difficult to reconsile either with his principle of pre-established harmony, or with his conception of a monad's changes as intrinsic to itself; but it seems unnecessary to discuss this here either, as it has no especial bearing on his treatment of 'causality' in general).

It might perhaps be supposed that Leibniz' treatment of necessity was outmoded by Kant's analysis; Leibniz, it may be

said, was thinking in terms of analytic necessity alone, whereas Kant has shown such an account to be inadequate. He has pointed out, it may be urged, that A may be necessarily connected with B although the connection is intrinsic to the nature of neither taken by itself; for he has drawn attention to the fact that if A and B are constructed so as to form constituents of a given synthesis, the position and character of each is thereby determined. It is in this manner that the character and relative positions of each constituent of a pattern is determined; and in the same way the characters of each member of a pack of cards or set of chessmen, and their mutual relations are determined by the rules in accordance with which the group is constructed and used. This form of necessitation is also exemplified in a language (in Carnap's sense which applies the title to all symbol systems to which transformation rules are applicable), so long as this is regarded purely formally (again in Carnap's sense); for here again there are discrete factors so constructed as to be capable of given syntheses.

Kant's approach to the subject, however, though in some respects, most particularly in regard to terminology, different from that of Leibniz, certainly does not provide a refutation of the latter's presuppositions, but rather the reverse. Kant, admittedly applies the term 'necessity' where Leibniz would refuse to do so. Yet so far from decrying the concept which the term represents for the latter (a concept whose exemplification Kant explicitly admits under the title of 'analytic necessity', or the

proper subject of 'analytic' judgments), or ousting it from the primacy Leibniz (in common with other rationalists) had ascribed to it, Kant could derive the certainty he demands from synthetic necessity only by assuming the synthesis to rest on a condition with which it is connected with absolute or intrinsic necessity. For although it is true that, given a certain synthesis, its elements must necessarily be such and such; yet before it is possible to say that those elements must be so on that account, they must be known to be its elements. Thus, if a given pile of cards is a complete standard pack, it must contain four suits each consisting of ace, king, queen, etc.; but I cannot know, on this ground, that there are four such suits in a given pile of cards unless I am first assured that it constitutes a standard pack. I may know that a given pile of cards is a standard pack because I have previously examined its contents and have no reason to suppose it to have been disturbed since. But clearly I cannot claim to have examined all phenomenal events past, present, and future, nor could Kant; nor indeed did he do so,, his use of the notion of 'synthetic necessity' was indeed aimed explicitly at remedying this defect. To have been justified in inferring conclusions about phenomena on the ground of their constituting a certain type of synthesis (as he claimed to be), he would have had to be assured that their forming such a synthesis was entailed by an actually existent condition. That Kant in fact assumed precisely that absolute necessity demanded by his conception of 'synthetic necessity' as the guarantor of the certainty of scientific

prediction, seems indubitable, although he does not appear to have fully realised the nature and significance of his basic premise. For in effect he assumes that the character of our experience, or rather of the 'universe' with which it presents us, is entailed by the nature of our perception.

Thus it is clear that Kant, in turning to 'synthetic necessity' for the solution of the inductive problem, showed not more insight than Leibniz, but less.

From what has gone before it should be apparent, as was indeed explicitly suggested at the outset, (75) that in the pre-established harmony Leibniz is affirming nothing else but Kant's 'synthetic necessity'. His treatment of the position has been seen to differ from Kant's in three respects. In the first place Leibniz regards 'synthetic necessity' as governing, not only phenomena, but also monads or noumena; whereas for Kant it is applicable, or at least can be asserted to be so, only in the phenomenal sphere. Secondly, Kant is interested only in arguing that our experience must exhibit a given type of synthesis, he is not interested in the question as to whether there might not have been any percipients of whose experience this is necessarily true. To Leibniz, on the other hand, it is important to insist that the synthesis governing monads (and hence phenomena) rests on a condition (namely divine concurrence) which might not have occurred. Lastly, while Kant postulates no intrinsic connections where he postulates 'causal' and other relations determined by 'synthetic necessity'; Leibniz, on the other hand, conceives such determination as entailing the

co-existence of continuants which are such that the changes intrinsic to the nature of each synchronise with those intrinsic to the natures of all the rest.

Similarly, despite fundamental differences between their theories, such as the postulation of but one 'substance' on the one hand and that of an infinite number on the other, there are parallels between Spinoza's approach to 'causal' notions and that of Leibniz. Thus, for instance, the theories of both exclude transeunt causation among phenomena, if this is regarded as an intrinsic relation between really distinct existents. And at the same time, despite thus contradicting commonsense, each accounts for apparent phenomenal interaction in terms consistent with the predictions of both science and commonsense.

Leibniz' treatment of the question of 'synthetic necessity' and apparent phenomenal interaction, is of great interest. It foreshadows, and indeed goes further than, Hume's conclusions in denying, not only the possibility of discovering intrinsic connections between phenomenal events, but also the existence of any such connection between them. And at the same time it reveals the inadequacy of the Kantian hypothesis, regarded as an answer to Hume which does not reject the latter's premises.

Leibniz' postulation of the twin principles of contradiction and sufficient reason (76) is a significant phenomenon to find at the end of the century of the rationalist. For it constitutes an explicit rejection of the increasing tendency to align all explanation with that proper to mathematics. It is, in effect, a

reaffirmation of the commonsense and Aristotelian belief that, while some things depend on 'causes' which entail them, others are dependent merely on conditions which render them possible but not inevitable. The wheel has thus gone full circle. Descartes accepted the commonsense and Aristotelian distinction between entailing and non-entailing 'causes', but at the same time did more than anyone else to make current the attitude of mind which tended to exclude it. Spinoza explicitly denied it; and finally Leibniz is found reaffirming it almost as though it were a new discovery.

NOTES.

1. Newton refused to postulate the law of gravitation as obtaining universally, allowing that there might be conditions hindering its operation in distant parts of space where we could not verify it.
2. The Metaphysical Foundations of Modern Science (Kegan Paul, Trench, Trubner & Co.Ltd.1925) Ch.11 (C) p.35 (Cf.pp.31-4)
3. Ibid. Ch.111 (E) p.89.
4. Cf.Etudes sur Leonard da Vinci Troisieme Series: Les Precurseurs Parisiens de Galilée
5. Quoted in Etudes Galiléennes (Hermann & Cie 1939) 1. A l'Aube de la Science Classique pp.18-27, 28-39, & 40.
6. Cf. Burtt: The Metaphysical Foundations of Modern Science Ch. 11 (C) pp.31-2: and Koyré: Etudes Galiléennes: 11 La Loi de la Chute des Corps pp.106-7.
7. Ch. 111 p.257
8. Cf.Recherche de la Verite Bk. Vl Pt. 11 Ch 3 T.Taylor's tr.1700 p.56 (referred to by Hume: Treatise Bk 1 Pt 111 Sect 14 p158 (Selby-Bigge Edition 1946) Eclairissement pp171 & 2.
9. Ch. 11 pp.252-3
10. Principles Pt. 1 Prin. XXVlll (Rose & Haldane trans.1931) p231
11. Meditation 111 pp.162-3
12. Ch. 111 pp255-6
13. Ibid. pp.255-7
14. Ibid. p.256
15. p.276
16. Summa Theologica

17. Cf. Ch.1. pp108-9; Ch.11 iii (e) p.222

18. Ch. 8

19. ii (a) p.266

20. Cf.Principles Pt.11 Prins XL. XL11. XLV, XLV1, XLV11 XLV111 XL1X,L,L1, L11, L111, L1X, LX.

21. Cf. Principles 11 Prin. XXV

22. Cf.Principles Pt.11 Prin. XXV1, XL, XL1, XL11, XL111, XLV1, XLV11, XLV111, XL1X, L, L1, L11, L111, LV1, LV11, L1X, LX, LX1

23. Etudes Galiléennes: 11 1A Loi de la Chute des Corps-Descartes et Galilée pp102-7.

24. Cf.Principles Pt 11 Prin. XXV

25. Cf. Dialogues Concerning Two New Sciences (Crew and De Salvo tr: Macmillan 1914) Fourth Day (296) Corollary p.276.

26. 1. p264

27. Med. 11 (Kemp Smith tr. Macmillan 1952) p.208

28. Cf. Phys. V111 10. 266b 27-267a 21.

29. Cf. Summa Theologica Pt.11 (1st Pt.) Q 85 A. 5 Rep. Obj.1.

30. Cf. Duhem Etudes sur Leonard de Vinci Troisieme Series: Les Precurseurs Parisiens de Galilee.

31. Ch. 1 (1v) p.147

32. Ethic Pt.11 Prop V11 Demon Corol & Schol.

33. Ibid. Pt.1 Prop. XX1X Demonst.

34. Ib. PT.1 Prop. XV111 Demonst.

35. Ib. Pt.1 Prop. XXV111 Demonst.

36. Ib. Pt.1. Prop. XXV

37. De l'infinito Dial. 1.

38. Ch.111 pp.250-1.

39. The Philosophy of Leibniz (Allen & Unwin 1949) Ch.1 Sect. 6. p.5.

40. 1.pp.261-3

41. Ibid.

42. Monadology (Latta tr. Clarendon Press 1898) 2 p.217

43. Cf.Latta: Introduction to the Monadology Pt.11 pp.27-30

44. Cf.Lettre a Arnauld (1687 (G.11 97): Replique aux Reflexions de Bayle 1702 (E.186 b; G.1v.561): Monadology 2; Principles of Nature and of Grace 1 (Latta tr.pp.406-7).

45. Monadology 7 p.220.

46. Ibid. 36-43 pp.237-41.

47. Ibid. 56, 57, P.248, 62 p.253, GII 71 (Quoted by Russell in The Philosophy of Leibniz: Appendix X1 pp260-1); G.1.383.(Quoted by Russell: ibid; Appendix XI P.259).

48. Monadology 48-9 pp.244-5.

49. Ibid. 60 p.250.

50. Ibid. 57 P248.

51. Cf.letter quoted by Guhrauer: G.W.F. von Leibniz, eine Biographic, vol.1. Anmerkungen, p.32. quoted in Latta's introduction to the Monadology pp.38-9: Nouveaux Essais p.376 (Latta trans.):GV.286 (quoted by Russell: Appendix IX p.223).

52. Monadology 52 p.246.

53. G.V.359 (Quoted by Russell in The Philosophy of Leibniz: Appendix VIII p.240-1; GIII 623 (Quoted by Russell ibid: Appendix X1 p.255.)

54. Cf.GII 261: GII 517 (Quoted by Russell in The Philosophy of Leibniz: Appendix IX p.249).

55. Monadology 49, 50 p.245.

56. Cf. Monadology 49, 50, 51, pp.245-7; and 56, 57 p.248.

57. Monadology 57, 58 pp. 248-9

58. G Vll 531 (Cited by Russell: The Philosophy of Leibniz Ch.XIII p.155) Monadology 21 pp.230-1.

59. Monadology 20, 21, 23 pp. 230, 231

60. Monadology 19 p.230

61. Monadology 83-6 pp. 266-8

62. Cf.Identification of 'contingent truth' with 'truth of fact'. Monadology 33, 36 pp. 235-6, 237. G.III 400 (Quoted by Russell in The Philosophy of Leibniz: App. III. p.208)

63. Summa Theologica Pt. 1. Q. XlX A. 3.

64. Ch. 8

65. G.11 46 (Quoted by Russell: The Philosophy of Leibniz Ch.111 p.27) Monadology 22 p.231; 60 p.250; G.111 400 (Quoted by Russell: The Philosophy of Leibniz: Appendix V p.224.

66. Ch. 11. v.pp.232-8.

67. G.III 400 (Quoted by Russell in The Philosophy of Leibniz: Appendix V p.223) GlV 438(Russell: App.III p.210.)

68. Summa Theologica Pt.1. Q.XlX A.3.

69. Monadology 41. p.240; 55. p248;

70. Ibid. 41.p.240.

71. Monadology 53-5 pp.247-8

72. Cf.Monadology 36-9 pp.237-9; and 46 pp.242-3

73. Ch. 1.ii. (a) pp.115-7

74. Cf. Summa Theologica Q XlX A. 3,8,10; Summa Contra Gentises Pt. 1. Chs. XXlll & LXXXl.

75. p.310 ff.

76. Monadology 31, 32 p.235; GVll 309: GII 49, GVII 199, (Quoted by Russell in The Philosophy of Leibniz: Appendix III pp. 209-10, 210, 211).

CHAPTER V.

BERKELEY'S ROLE IN THE DEVELOPMENT OF CAUSAL THEORY.

Berkeley's contribution to causal theory is somewhat overshadowed by the fundamental revolution in that of his successor, Hume. Hume's philosophy, though not the logical outcome of that of Berkeley, was its natural heir so that one might regard the existence of a Berkeley not followed by that of a Hume as very unlikely. Yet had this improbability been realised, Berkeley would have appeared to posterity as a striking revolutionary in his treatment of 'causality' (1).

It is true that he was not a revolutionary in the fundamental sense in which this is true of Hume: he did not challenge the generally accepted claim to postulate some intrinsic connection between any 'cause' and 'effect', properly so-called; nor the belief that we can justly apply the titles 'cause' and 'effect', so defined, to actual existents. Nor did he institute the lesser revolution of an Aristotle or a Descartes, in introducing a conception of 'causal determination foreign to contemporary thought. He neither introduced teleology to an age in which 'efficient causes' were the accepted explanations of physical phenomena, nor affirmed mechanism in an age accustomed to think in terms of teleology. Although he maintained teleology at a time when mechanism was fashionable, this was hardly revolutionary since the idea had not yet been forgotten. He was taking a side in an argument which was still alive, and was no more revolutionary than a man defending liberalism (in the specialised political sense) in modern England. An English

philosopher upholding teleology a century later would have had a far juster title to be called revolutionary on this score.

The form of 'causal' influence postulated in Berkeley's writings, is that of a mind producing ideas and affecting other minds. Thinking and willing are the activities by which it does this. There was nothing revolutionary in this; it was a form of influence recognised by Scholastics, Cartesians, and, indeed, most thinkers. Even Locke the father of English empiricism, and Leibniz who explicitly denied all interaction, yet treated mind as a transeunt 'cause' (though for Leibniz only God was such a 'cause').

Yet Berkeley's doctrine was indeed revolutionary, and can truly be said to have laid the foundations of the phenomenalist, account of 'causality'. The basis of the Berkeleian revolution was the denial of matter, with the consequent reinterpretation of experience. This denial involved a denial of physical interaction, since Berkeley maintained that when we suppose ourselves to be experiencing the physical universe we are in fact experiencing only passive ideas which could not interact even should it be possible to formulate a theory of their interaction ~~which should be~~ consistent with the facts thus interpreted. It is not simply his denial of physical interaction which laid the foundations of phenomenalism. Leibniz denied physical interaction in denying interaction in general, yet there was nothing in his account of experience to suggest phenomenalism. It is the character of the account of the uniformity of experience and the expectation of future uniformity, which he offers, that made Berkeley the father of phenomenalism. Berkeley's

philosophy is essentially a criticism of Locke. The latter, in developing the doctrine of representative ideas, was led inevitably to postulate on the one hand matter - unknown and unknowable, and on the other 'ideas' - the content of sensible experience (i.e. sensa or sense data, as they would generally be called today). Very reasonably Berkeley rejected the notion of an unknown and unknowable somewhat, as useless and unintelligible. This left him with only collocations of sense data, and amounted to a denial of the physical world in the Cartesian sense of the term. It was for this reason that his philosophy was so shocking to his contemporaries who had come to accept the Cartesian universe, one might almost say to take it for granted. (His contention that the 'material universe' exists solely as the content of some perception is, of course, equally startling to commonsense).

Thus Berkeley is in complete agreement with the phenomenalist as to the content and object of sensible experience, and, as will be seen, in regard to its practical interpretation also. He himself is not a phenomenalist, since he does not regard sense data as the sole existents. His interpretation of experience depends on the conviction that the existence of 'ideas' (i.e. sense data) presupposes that of a mind which experiences them. Hence his universe contains minds regarded, not as collocations or 'bundles' of experiences, but as continuants possessing conscious perception. Further he regards its existence as presupposing that of a supreme mind (i.e. God), as necessary to account for the continuity and uniformity of sensible experience, and its independence of human volition,

conceptions which no phenomenalist would admit. It is perhaps ironical that the interpretation of experience which seemed to Berkeley to argue most strongly the existence of the suprasensible, an interpretation which he developed for this very purpose, should have carried the opposite conviction for his successors. Berkeley says no more to elucidate the 'causality' of the mind than his predecessors. Indeed he says considerably less than Aristotle and the Scholastics since he is far less precise in analysing the twin functions of understanding and volition which, with them, he regards as the activities of mind. His apportioning of activity and passivity to mind and ideas respectively, prevents him from acknowledging the passive element in perception, although he implicitly admits it in recognising that sensation is involuntary.

Again, he ignores the part which volition must have played in the construction of the ideal universe in the mind of God. Since the ideas are distinct from God, yet dependent upon Him, presumably their relation to Him must be analogous to that of any idea to the mind which produced it. When a man regards himself as responsible for an idea, he supposes it is dependent on his will; he supposes he can either entertain it or not as he chooses. Moreover, inability to choose or control anything in his experience is regarded as weakness or impotence. Berkeley clearly held these views; he also held God to be omnipotent and independent. It would, therefore, have been contradictory for him to suppose God intertained ideas which were not dependent on his will. Yet from what he says, one might suppose Berkeley to have regarded the continuum of ideas which we call the external world, as God's dream - a view to which he could

never have subscribed explicitly. The failure to appreciate this, doubtless rests on the failure to distinguish the active and passive elements in perception. For him perception means activity, and activity means responsibility; hence for him to say God perceives is to ascribe independence and responsibility to Him. Yet Berkeley's own admission of the independence of sense-data, together with his view that in them we are perceiving reflections, as it were, of ideas in the mind of God, is completely contrary to the notion that perception is wholly active. To say that my perception is dependent on something outside myself and is in effect receptive, is to say that it contains a passive element. Therefore Berkeley does not sufficiently account for God's 'causality' in producing ideas, by calling it perception; he should have distinguished between the perception which is wholly active and that which contains a passive element, if he was to have made his conception of God's causality at all explicit. From this it is clear that Berkeley made no positive contribution towards the definition of 'causal connection'.

His contribution lies entirely in his account of the uniformities of experience and the expectation of future uniformity, in other words his account of 'causal laws' as these are ordinarily understood. When I speak here of his account of experience I mean, of course, not his ultimate explanation of it in terms of divine ideas, but his analysis of its immediate content and man's reaction to it.

As has been seen, for Berkeley what we call the 'external world', the object of sensible experience, consists entirely of what he calls 'ideas', that is to say sense data variously correlated. Since it

is one of the two basic constituents in his universe, it is unfortunate that Berkeley does not define 'idea' more precisely. He applies the same term 'idea indifferently to both objective sense experience and the contents dreams imaginings and illusions, although he himself recognises the distinction between objective perceptions and chimeras (2). He makes no use of the distinction between simple and complex ideas, adopted by both Locke and Hume. Again, although ostensibly applying the term 'ideas' to everything in the mind, his discussion of abstract ideas suggests that, like Hobbes, he uses the term, 'idea' as synonymous with 'image'. Clearly he cannot identify 'idea' with all elements of the mind's content indifferently since we understand what is meant by being possessed of three sides independently of understanding what is meant by being isosceles scalene or equilateral, ~~since~~ otherwise we should not attribute that character to all these figures indifferently. Indeed his introduction of the term 'notion' is a tacit admission of the inadequacy of 'idea' to its appointed task. Berkeley insists (3) that we have a 'notion' of God and the soul although we possess an idea of neither; in other words, he admits that there is, among the contents of the mind, something which does not come within his definition of 'idea'. This is a very serious admission since it completely overthrows his system; indeed it is very surprising that he did not find it more disturbing.

The first and third of these ambiguities need not be pursued further here; they are relevant to the present discussion only as

they illustrate the vagueness of Berkeley's use of the term 'idea'. For whatever the demerits of Berkeley's definition of 'idea' if this is required to apply to all the contents of the mind, there is no doubt as to what he means when he maintains that the 'external world' consists solely of ideas. This quite evidently means that the object of sensible experience is nothing but sense data in various collocations. The second of the ambiguities listed above, however, greatly detracts from the clarity of his account of the 'external world'. For that with which the senses present us is a complex of simple constituents. We perceive simple sense data (4) a red patch, heat, etc., but we never perceive them singly; they are always combined in some highly complicated manner. It is therefore seriously misleading to apply a single term to the objects of sensation in general, without qualification. For these complexes and their simple constituents may equally be meant by it; and clearly propositions which apply to the one, will not always apply to the other (an obvious example is: The objects of sensation are simple). Sometimes the context might make it clear to which the writer was referring; but if he were discussing a controversial issue, which would be just the occasion on which it would be most essential to be sure as to what he meant, it might be extremely difficult to tell to which he was referring and hence what he was really trying to say. So in speaking simply of 'ideas' as the content of experience, Berkeley is making his views unnecessarily obscure, and forcing those who endeavour to interpret his theory, to apply the distinction to it as well as they can.

The first paragraph of the 'Principles of Human Knowledge' makes it clear that Berkeley does recognise this distinction. Here he enumerates sense data (colours, scents, taste, heat, hardness, sounds), which he describes as 'ideas' which are the objects of sense: he then proceeds to explain how, in experience, we find them associated in complexes e.g. apples, stones, trees, books (5). Since he here refers to the simples as 'ideas', and to the complexes as collections of ideas', one might well feel justified in interpreting his term 'idea' as applying solely to sense data. In discussing 'visible' and 'tangible figure, however, he speaks (6) of a tangible figure' as an 'idea' although it is evident that the experience of 'tangible figure' involves more than one simple sensation. Elsewhere (in discussing distance) (7) he defines 'idea' as 'the immediate object of sense or understanding', a definition which would seem more applicable to the complexes than to their elements, since on the evidence of experience it is the complexes which we know directly, their components being distinguished only after subsequent (and sophisticated) analysis (8)

When anyone is discussing whether 'ideas' can be 'causally' connected, and whether there is any evidence that they are, it is clearly important to know whether he is speaking of the simple or complex elements in experience. There might be no ground for asserting 'causal' connections between 'simple ideas' or sense data, while there might be some for supposing such connections to hold between certain complexes of sense data when these happened to be formed. That is to say though it might be held that there was no

causal connection between redness and sweetness, or even between the various visual or tactile and kinaesthetic sensations involved in eating an apple, it might be supposed that there was such a connection between the successive complexes of data which make up the complete experience of eating an apple. Thus to deny 'causal' connection between 'simple ideas', is not necessarily to deny such sonnection between 'complex ideas'; and evidence for or against such connection between the former, is not necessarily evidence for or against such connection between the latter.

Berkeley frequently insists that, being passive, 'ideas' cannot constitute 'efficient causes'; (9) and it is evident that he supposed that in so doing he had disproved any 'causal' connection between them, since he finds it necessary to explain scientific law and the common-sense experience and expectation of natural uniformity in non-causal terms. It has been seen that he does not regard 'efficient causation' as the only form of 'causal' connection, since he defends teleology. As it is evident that his 'ideas' could not be regarded as 'final causes', he doubtless thinks it unnecessary to point this out. Besides, it is the mechanical interpretation of experience current with his contemporaries, which he is concerned to disprove. No one of them was likely to attribute any but 'efficient causation' to 'ideas'.

His conviction that their passivity disproved their 'efficient causality', together with his belief that this is sufficient to disprove all 'causal' connection between them, shows that for him, the initiating 'cause' must be active. That is to say he does not

entertain the possibility that an idea, though passive, might be such that its existence under given conditions A would entail the existence of another under given conditions B: nor does he suppose that the existence of one might depend on that of another because they were correlated as members of a pattern established certainly, but on some other basis than the intrinsic connection of its members.

Even had he not so defined 'efficient' or 'mechanical causality' at the same time insisting on the passivity of 'ideas', Berkeley could, with consistency, have ascribed 'causality' to them in none of the senses current at that time - neither the necessary connection, of Cartesian physics, nor the less rigid connection of Aristotelian and Scholastic natural law, nor even the vaguer and more generalised concept of commonsense. He could not have ascribed it to 'simple ideas', and this for an obvious reason. All the causal connections commonly ascribed to the 'external world', all those supported by any evidence at all, are connections between, not sense data, but 'physical objects'. There is no need to enter into the controversy over the nature of 'physical objects' here. Whether 'physical objects' are more than collocations of sense data, or not, the distinction between a sense datum (say a red patch) and a 'physical object (e.g. a pillar box) is evident. We may not be quite sure in what that to which we apply the term 'pillar box' consists; but we know that we apply it to something in experience which involves the visual datum red, but also involves more than this.

Even if the phenomenalist be right in maintaining that there is no ground for supposing the existence of anything but sense data, it is evident both that there are observable regularities in experience, and that these do not consist in connections between sense data as individuals but rather in connections between collocations of sense data and their relations one with another. There is, for instance, no regular connection between the visual datum red and the tactile datum pain. Yet there is such a connection (at least the evidence suggests such a connection to have obtained in the past) between what we call experiencing the presence of a fire (i.e. an experience involving the visual data red, black, and orange patches of various types, together with the tactile datum heat, and auditory data — crackling etc.), the experience of moving in a certain direction relative to these data (also a complex of data, visual, auditory, tactile, and kinaesthetic) and the tactile datum pain. Whatever, therefore, may be said of the adequacy of the uniformities of experience as evidence of 'causal' connection, it is clear that they provide no evidence of any 'causal' connection between sense data regarded as individuals (10).

Nor would Berkeley have been justified in regarding them as evidence of 'causal connections between complex ideas or collocations of complex ideas. The fact that the complexes connected in experience are normally composed of data proper to several senses, and the great complication of the connections observed in experience, would render it extremely difficult to attempt to substantiate such a view under the most favourable circumstances. Berkeley's

insistence on the complete distinction between the ideas of each sense and those of every other, however, would forbid such an hypothesis even were all the other difficulties removed. Repeatedly he affirms that the objects of each sense are completely disparate. Not only are they utterly distinct, but there is no basis, no ground, for any relation between them. Even 'visual figure' is completely different from 'tangible figure' (11)

The basis of Berkeley's position is readily understandable, even though the conclusion he draws regarding figure seems to be in flat contradiction to experience. It is a commonplace that it is meaningless to compare a colour with a scent or a sound since there is nothing common to them which would serve as a basis of comparison. Since Berkeley holds that the external world consists of nothing but sensations in various correlations, he cannot consistently hold there to be any similarity or basis of comparison between 'visual' and 'tangible figure'. For then 'tangible figure' consists in nothing but collocations of tactile sensations, while 'visual figure' consists in nothing but a collocation of visual sensations. It is necessary only to experience both, to realise that there is no more relation between the sensations involved in 'feeling a square' and those involved in 'seeing' one, than there is between a scent and a sound. The fact that, in spite of this dissimilarity, there still seems to be an element common to what we perceive in each of these experiences, should have presented a serious problem for Berkeley; but he does not seem to have realised this.

If (as is evident) there is no basis of comparison between the data supplied by different senses, clearly there can be no 'causal' connection between them in any of the senses familiar to Berkeley. It has been seen that for both Cartesian and Aristotelian, its relation to the 'effect' is intrinsic to the character of the 'cause', while the same view is implicit in the commonsense usage. A 'causal' connection, according to any of theses usages, clearly could not exist between completely disparate terms. The data proper to the various senses are not totally unrelated, however; a visual and a tactile sensation may be either simultaneous or successive one to another. They could therefore be 'causally' connected in the Kantian sense of forming a given temporal pattern in order to constitute human experience. But this notion of 'causation' would not have suggested itself to Berkeley; for it had not been held at that time, or prior to it; and, further, it is a complex method of accounting for experience, which would have been unlikely to suggest itself save as an escape from the conclusions of a thoroughgoing phenomenalism (which Berkeley himself never approached).

But the regularities observed in experience, as has already been illustrated by the former example, involve complexes to which the data several senses contribute. In the example quoted, the tactile datum pain regularly follows a given correlation of complex experiences which include visual, auditory, tactile, and kinaesthetic, data. And this example is typical. The uniformities of experience, therefore, could provide no evidence of

'causal' connection between complex ideas which Berkeley would have been justified in accepting.

Berkeley's 'external world' is therefore one which has since become familiar to British philosophers, and has been accepted by many of them; but which before his time had never been postulated. This is an 'external world' composed of elements between which there is no intrinsic connection, a 'world' whose uniformities are inexplicable in terms of intrinsic connection, a 'world' in which a 'causality' which means more than regularity is inadmissible. The historic importance of Berkeley in relation to 'causal' theory. is thus seen to be immense.(12).

Like Hume, Berkeley accounts for the conviction that the sense data always found together are in fact causally connected, by pointing to their constant association. (13) Like Hume he accounts for the unshakable conviction that the observed uniformities will continue to obtain in the future, in terms of the connection we have attributed to sense data through finding them constantly together.(14).

Berkeley himself, of course, supposed the future's constancy assured by the divine goodness and immutability, believing the ordering of sensations to be, not arbitrary, but ordained by God for the purpose of securing human welfare. (15) He thus disagrees with his phenomenalist successors and heirs, both in his interpretation of the 'external world' he bequeathed to them, and in his estimate of the sources of human knowledge. But in his view of the evidence provided by the 'external world' for intrinsic connections within that 'world', and the future constancy of past

uniformities, he is at one with them. It is necessary only to seek the bridge between Berkeley's world of discrete 'ideas' and his world of spirits, to find oneself left with nothing but the discrete 'ideas' i.e. his external world. And his 'external world' alone, is the phenomenalist's 'world' of arbitrary associations and uncertain future. Hume had only to adhere rigidly to the Berkeleian definition of 'idea', together with the tenet made explicit by Berkeley (although he did not adhere to it consistently himself)—namely that 'ideas' are the sole content of experience; to achieve the uncertainty of a world of arbitrary connections alone.

NOTES.

1. It is not necessary here to discuss Berkeley's theory of the 'external world' in detail. I shall, therefore, do no more than state his views except when their discussion is relevant to his contribution to 'causal' theory.

2. Principles of Human Knowledge (Jessop Edition: Nelson 1945) 33 p45.

3. Ibid. 27 pp. 42-3.

4. Throughout the ensuing pages I shall confine the term 'sense datum' to the simplest elements in experiences - e.g. colour patches - as this seems to be the only useful application of the term. This is not an universal practice: cf. for example, Price: Perception Ch. V pp.114-6 1950 edition. But if one applies the term to complexes there is no criterion for deciding which complexes shall be called sense data unless he goes beyond simple elements of sensible experience. If, as in Price's example, one speaks of sensing a single black and white sense datum when 'looing at a black and white cat', if he is not to define his usage in terms of, or with reference to, physical objects, why should he not go further and say that his sense datum is black, white, green, brown, cream, and red, when he is at the same time 'seeing, cat, rug, chair, fireplace, wall, and books' of these colours'. And although it may be possible to make significant assertions about physical objects in terms of sense data, the use of sense data language is clearly useless if 'sense datum' cannot be defined independently of 'physical object'. Nor is it of any value if it does not enable us to differentiate the elements in a complex sense field.

5. Principles 1 p27

6. An Essay towards a New Theory of Vision (Dent Everyman Edition 1946) CXXVll p.71

7. Ibid. XLV p.33

8. Were this not witnessed sufficiently by experience, the fact that until the seventeenth century no philosopher thought of describing the 'external world' in terms of anything but physical objects' - i.e. complexes - would sufficiently confirm it.

9. Principles 25 pp.41-2: 102 pp. 88-9: 107 p.91

10. For a full discussion of the inadequacy of simple sense data to construct even the 'causally' connected 'external world' of commonsense cf. Price: Hume's Theory of the External World, particularly Chs. ll & lll.

11. New Theory of Vision CXXVll pp.71-2, XXXVl pp. 27-8

12. It is true that Locke, in effect, suggested this view in denying any apparent intrinsic connection between the phenomenal properties of physical objects (Essay Bk lV Ch. Vl. par. 5-10), especially in denying any such connection between specifically 'causal', properties (i.e. solubility in aqua regia and malleability) and others. For if we can discover no intrinsic connections between the 'causal' properties of physical objects and any other phenomenal characteristic by which we may distinguish them, neither can we assert intrinsic 'causal' connection between such objects. But Locke cannot properly be called the father of this view of 'causation' since he did not take his premises to their logical conclusion in this respect, instead still maintaining intrinsic 'causal' connection between 'physical objects' to be attested by experience. (Essay Bk ll Ch. XXl par. 1)

13. Principles 30. p. 44

14. Ibid. 31, p.44; 59 p.61

15. Ibid. 32 pp.44-5, 62-6 pp.63-7; 107 pp. 91-2

CHAPTER VI.

HUME'S TREATMENT OF 'CAUSATION' AND 'CAUSAL' INFERENCE.

(1) INTRODUCTION.

The traditional interpretation of Hume's discussions concerning 'the understanding', treats their outcome as purely negative. Hume is regarded as taking premises about experience and its relation to knowledge (which he shares with Locke and Berkeley) to their logical conclusion - namely scepticism. He is thus held to have shown, by remorseless logic, that one must reject either at least one of these premises, or else beliefs integral to everyday life; and since the latter alternative is a practical impossibility, his analysis is thus held to reveal that one at least of his premises is false. Hume himself is regarded rather as a modern Moses leading the way to a promised land which he may not enter, since he is held to cling doggedly to both the fatal premises and the self-destructive scepticism to which they lead.

Reid and Beattie first gave currency to this type of interpretation. (1) They were concerned primarily with Hume's discussion of belief in persistent minds and physical objects, regarding him as taking the doctrine of ideas to its logical conclusion by doubting the existence of both mind and the external world. And since his Hume - inspired vindication of 'causation' rests on a view of the relation between knowledge and experience which he regards as revolutionary, (2) and he took great trouble to attain just this, it seems clear that Kant similarly regards Hume's treatment of 'causation', though accepting, in essence, the doctrine of ideas.

This mode of interpretation is rejected by N.K.Smith, (3) who holds Hume's treatment of these questions to have a positive as well as a negative aspect. The denial of any rational justification for belief in the existence of persistent entities, and in the reliability of causal inference, he cannot deny; and, indeed, he has no wish to do so. His view is that this is the beginning and not, as is generally supposed, the end of Hume's approach to the matter. For he contends that while Hume maintains these beliefs to have no rational justification, he held also that neither can they be shaken since they rest on 'feeling' or 'sentiment', and are a reaction as integral to human nature as coughing or sneezing. There is thus no question of rejecting them, or committing himself to the position of a sceptic with regard to them. Indeed N.K.Smith affirms that Hume is anxious to emphasise the Lockean premises from which he deduces the inadequacy of reason to account for these beliefs, precisely in order that he may be free to insist on their complete dependence on feeling. (4) He holds that in this Hume is the disciple of Hutcheson, and is, in effect, extending the essence of the latter's conception of moral sense,(5).

Whatever interpretation of this section of Hume's teaching is given, however, and whatever view is taken of its justification, it is generally agreed that his denial of the possibility of a rational basis for either 'causal' inference or belief in universal 'causality', is a necessary deduction from his premises.

Most of Hume's successors disagree with him in maintaining that there is a rational justification at least for regarding 'causal' inference as leading to probable conclusions. The commonest divergence of view on his teaching concerns whether or not he was justified in denying that the existence of one event can ever be known to be entiled by that of another. The following sections are devoted to my account of Hume's discussion of 'causation' and 'causal' inference, and my assessment of it. I shall not, therefore, discuss these views here. I enumerate them merely because it will be useful to bear them in mind with reference to what follows. I shall only remark that I hope to show both the traditional interpretation and that of N.K.Smith, to attribute too dogmatic an attitude to Hume. This may sound paradoxical, but is not really so. The traditional view regards Hume as doggedly maintaining scepticism; N.K.Smith thinks him convinced that he has a radically new theory which renders all arguments leading to scepticism abortive - a theory which regards our belief in 'the external world' and the validity of 'causal' inference, as unshakable because resting on a sentiment or instinct integral to human nature. I hope to show that while it is true both that Hume denies the rational justification of 'causal' inference and maintains that our confidence in it rests on feeling, he neither explicitly rejects such inference, nor has the attitude of the triumphant discoverer of a new theory which sets sceptical doubts to flight. For it seems to me that Hume's attitude is that of a man who has discovered a problem to which he honestly cannot find

any solution.

In conclusion I will make only two observations concerning the rival interpretations considered above. The traditional view labours under a grave disadvantage in that while attributing acute logical insight to Hume, it supposes him blind to an implication of his own philosophy which is obvious to his critics (6) On the other hand, he has clearly no right to the position which N.K.Smith attributes to him. For if he is correct he has no rational justification for postulating so much as a constant conjunction when this is regarded as a generalisation and does not refer merely to his own past experience. He has thus in fact no rational justification for prophecying that human sentiment will in the future be of the same nature as in the past, let alone that a certain type of sentiment will continue to occur under the same type of circumstances and be accompanied by similar propensities. He is therefore entitled to no confidence in the constancy of any type of belief, either on the ground that it consists in the conjunction of conditions, sentiment and propensities of certain specified types which he has always found conjoined in the past, or because he has in the past always found it in a given relation to such a conjunction. Nor is it of any use to say that Hume has shown the possibility of dispensing with rational justification in such circumstances, for such dispensation must itself be rationally justifiable if it is to be acceptable.

(iii) The Origin of Ideas.

Hume's approach to 'causation' rests on his view of the origin of ideas. Therefore, although the latter is made explicit in sections of the Treatise and Enquiries (7) other than those devoted to 'causation', it will be well to summarise it here.

The accounts of the origin of ideas appearing in the Treatise and the Enquiries are essentially the same; and in each work the subject is accorded a priority appropriate to its fundamental position in Hume's philosophy, (though this latter is made explicit in the Enquities only). (8) Thus the opening section of the Treatise is devoted to it, while in the Enquiries it is placed second only to an introductory account of contemporary views of philosophy and Hume's own conception of the latter's proper role.

Hume's account of the origin of ideas opens with an analysis of experience; or rather with a statement of the result of such an analysis, a result which Hume evidently sees no need to defend. The contents of experience are said to be of two types: namely 'impressions' and 'ideas'. Of the title 'impression' Hume writes (9) 'under this name I comprehend all our sensations, passions and emotions, as they make their first appearance in the soul'. He continues 'By "ideas" I mean the faint images of these in thinking and reasoning; such as, for instance, are all the perceptions excited by the present discourse, excepting only those which arise from sight and touch, and excepting the immediate pleasure or uneasiness it occasions. From this, and from his subsequent illustrations and usage, it is clear that by

'impressions' Hume means what would ordinarily be called 'real' or 'genuine' sensations and emotions, as opposed to their counterparts in memory and imagination, the latter clearly being Hume's "ideas'.

The only criterion he offers for distinguishing 'impressions' from their images, is the greater 'force and liveliness with which (the former) strike the mind'. (10) But, as Hume himself admits, (11) this criterion is not infallible; for in sleep, delirium, drunkennes, and hallucination, that which would at other times generally be redognised as purely imaginary, has (or seems to have) the vividness of real sensation and emotion, and is, at the time it is experienced, mistaken for such. Moreover, our conviction, once conscious, that it was imaginary, does not rest on the realisation that in fact it lacked the required vividness; indeed, we often remark that our dreams seemed as vivid as 'real experience'. If, for instance, I wake inland after dreaming I was at sea, I conclude the supposed experience of seafaring to be imaginary because I suppose I could not have been transferred from sea to an inland situation without having any memory, or even any evidence of the dhange, and because, my suddently taking boat is inconsistent with what I believe to be reliable memories of my past actions and intentions. (12) It is strange that Hume should have adopted a criterion so plainly inadequate, overlooking completely the persistent coherence of 'real experience' as ordinarily distinguished, which renders his definition inconsistent with the usage of plain men and philosophers alike. It is probable that Hume was

unduly influenced in favour of regarding liveliness as the distinguishing mark of impressions, because this supposition enabled him to frame a conception of belief which did not presuppose the existence of anything beside impressions and ideas. In saying this I do not mean that he dishonestly adopted definitions which would favour his own theories, but merely that the general trend of his thought made him prone to notice some factors rather than others.

Hume applies the terms 'impression' and 'idea' both to complexes and their elements, distinguishing the one from the other by the addition of the adjectives 'complex' and 'simple' respectively. By a simple impression' he evidently means a sensation or feeling uniform in type, such as a given simple sound, or a patch of colour of a given shade and shape. Thus he cites an apple (to be precise he should rather have written 'one of the complex experiences which verify the sentence "Here is an apple"', or words to this effect), as in instance of a 'complex impression'; its colour, taste and smell, as some of the 'simple impressions' of which this complex is formed. (13) Clearly his simple impressions must be quantitatively complex; for we can experience only that which has duration, and indeed we can touch and see only that which has spatial extension as well. There is, however, no evidence as to whether Hume would donsider a simple, uniformly coloured patch of complex shape, e.g. the visual appearance of a clover leaf, as a simple or complex impression.

From these basic materials, Hume constructs his account of the origin of ideas. This may be stated briefly and simply as follows. Any given type of simple idea exists only if there exists, or has existed, a similar simple impression. There may, and indeed do, exist many complex ideas of a type to which no impression corresponds; but the simple ideas which constitute these complexes are all similar in type to impressions previously experienced. (14) He does not make it explicit that an idea need not exist contemporaneously with the impression, or impressions, from which it derives. But he evidently supposes so; for he holds ideas to be used in reasoning, and clearly impressions to which they are relevant need not be, and often are not, experienced im the course of reasoning.

He further fails to distinguish the two questions as to whether a simple idea can exist unless a similar impression exists or has done so, and whether a simple idea may exist in one persons's experience without the corresponding impression having done so. That these are distinct questions should be recognised since it is possible that dependence of idea or impression might be true only in the more general sense, and clarity demands that whether this is so or not should be made explicit. Again, Hume's view, though not explicitly stated, is evident from what he writes; for, in defence of his doctrine of the dependence of ideas on impressions, he cites the impossibility of a blind man's imagining colour or of a deaf man's imagining sounds. (15)

In the Treatise the conclusion that ideas depend on impressions, is reached by means of two stages. Hume maintains first that to every type of simple idea in existence there corresponds a similar simple impression, and vice versa; (16) and then he proceeds to argue that every simple idea depends on, and derives from, a similar impression. (17) In the Enquiry, (18) however, he argues in favour of the latter contention without previous reference to the former. This is an improvement. For it is the second contention alone which states an account of the origin of ideas; and moreover this both comprehends that in the first which is relevant to it, and may be stated and defended without previous separate reference to this latter.

Hume urges three arguments in defence of his contention that ideas depend for existence on impressions. He points out that whenever anyone wishes to give a child an idea of a colour or a taste, he tries to enable him to experience the appropriate impression, whereas no one supposes he can evoke the impression by exciting the idea. (19) Again he recalls that if, through an organic defect such as blindness, a person is unable to experience certain 'impressions', neither does he experience the corresponding 'ideas'. (20) And he further urges that analysis of any of our ideas, will reveal it to be resolvable into simple ones to which impressions correspond. And he evidently bases his confidence in this latter assertion on the fact that he has not discovered any idea which he could not so resolve to his own satisfaction; for he challenges anyone who rejects his conclusion,

to produce one 'idea to which there corresponds no 'impression'. The first of these three arguments occurs only in the Treatise; the second in both Treatise and Enquiries; while the third is to be found only in the Enquiries (21) as a defence of the view that ideas depend on impressions, but appears in the Treatise (22) urging similarity between simple ideas and impressions. In the Treatise however, this latter argument is treated more modestly than in the Enquiries where it is styled a proof; (23) for in the Treatise Hume says that he has satisfied himself regarding it, though his point cannot be proved since every idea cannot be enumerated; and then offers his challenge (24).

It cannot be denied that none of Hume's arguments renders the dependence of ideas on impressions more than probable, in that they all leave it open to disproof by the appearance of an idea not so dependent. Nevertheless, he seems to have unshakable conviction in the universality of this dependence. Thus, for instance, in examining the idea of 'causal connection' he never even considers the possibility of its not deriving from an impression, instead persisting in his search for an appropriate impression even in the face of apparent defeat. (25) And, indeed, in the Enquiries he makes it explicit that he regards as meaningless any term which cannot be shown to apply to an impression, on the ground that unless it does so it applies to no idea either. (26) For this confidence he offers no justification. Indeed he does not even offer any argument to show that it is at least more reasonable than not, to assume such dependence.

In both the Treatiese and the Enquiries (27) Hume admits one exception to his general rule; namely that it might well be possible to imagine a shade of colour one had never seen, if one saw every other shade of that colour in order. But he says that 'this instance is so singular that it is scarcely worth our observing and does not merit that for it alone we should alter our present maxim'. (28) Such arbitrary dismissal is clearly unjustified since Hume's 'instance' in fact refutes his 'maxim', insofar as this affirms that no idea exists within one person's experience unless within that experience has also existed an impression, or impressions, qualitatively indistinguishable from it, or its elements. And that Hume should have dismissed it so, is the more surprising since he might have modified his 'maxim' consistently with this 'instance' without sacrificing the former's importance as a basis of empiricism. For in this 'instance' the 'idea' obtained independently of a completely similar impression, yet closely resembles 'impressions' experienced contemporaneously with it. If, therefore, this were the only exception to Hume's original generalisation, he could have asserted with justice that no simple 'idea' exists unless there exists or has existed, an 'impression' which either completely, or very closely, resembles it.

Hume's view of the nature and origin of 'ideas', combined with his retention of the customary identification of 'having an idea of' with 'understanding', provided him with both a criterion of meaningfulness and a directive as to how to achieve understanding.

For, given these premises, a term is 'meaningful' only if it can be shown to have application to an 'impression' which either exists or has existed; and to understand a term is to realise to what 'impression' it is applicable. These conclusions are drawn explicitly in the Enquiry. Thus he writes: (29) 'When we entertain, therefore, any suspicion that a philosophical term is employed without any meaning or idea (as is but too frequent) we need but enquire, from what impression is that supposed idea derived.' And again: (30) 'It seems a proposition, which will not admit of much dispute, that all our ideas are nothing but copies of our impressions, or, in other words, that it is impossible for us to think of anything which we have not antecedently felt, either by our external or internal senses.....Complex ideas may perhaps be known by.....an enumeration of those parts or simple ideas which compose them. But when we have pushed up definitions to the most simple ideas and find still some ambiguity and obscurity; what resource are we then possessed of? By what invention can we throw light upon those ideas, and render them altogether precise and determinate to our intellectual view? Produce the impressions or original sentiments from which the ideas are copied'. This explains why, in both Treatise and Enquiries Hume treats the examination of the idea of 'causal connection' as essentially a search for an impression whence it arises.

No one, I think, would contest Hume's assertion that there is no image which neither resembles an 'impression' nor is composed of elements which do so. But, given his definitions at their face value, his contention that 'impressions' and their images constitute the sole constituents of experience, seems to me clearly false. For, not only do we experience sensations and feelings, and their images, but (as, Hume both assumes throughout his philosophical works and asserts explicitly), (31) we also recognise their distinctive characters, compare them, and recognise their differences and resemblances. And this comparison and recognition is neither image, sensation, nor feeling, in the accepted sense of these terms.(32). Indeed, even when we have names for the experiences we recognise and compare, these processes are not ordinarily so much as accompanied by the auditory images of words, as is so much mental activity. For instance, when I recognise a sensation as 'seeing something blue', and compare this with others, I do not normally' say to myself': 'This is blue and, in this, is like that and unlike the other', or words to this effect.

It might be argued that Hume intended to apply the term 'impression' to comparison and recognition, since he meant it to apply to every 'real' experience; and that he failed to make this clear by not explaining that he does not adopt the ordinary definition of one or more of the terms 'sensation, 'feeling' and 'emotion'. But if this was his intention, he uses no terms to differentiate 'impressions' of the type of sensations and feelings, from those of the type of comparison and recognition. And an

usage which fails to distinguish experiences as different as these, is so inadequate as to be misleading.

Even though it be granted that, given a wide enough connotation of 'impression', Hume's contention that experience consists in 'impressions' and 'ideas' alone, is true (though misleading unless further qualified); his view of 'meaning' is yet not justified. For he is mistaken in supposing that 'understanding' a term is necessarily to have an image to which it is applicable. That entertaining such an image is not essential to understanding a term is, indeed, intrinsic to Hume's denial of the possibility of forming an image of Paris; though he fails to notice this. He writes: (33) 'I have seen Paris, but shall I affirm that I can form such an idea of the city as will perfectly represent all its streets and houses in all their just proportions'; thus revealing that he well understands to what the term Paris is ordinarily applied, though he admits he can form no image of this. But if entertaining an image of that to which it is, or would be, applicable is not necessary to understanding a term, neither is the latter's applicability to an impression, or group of impressions (whether actually ever conjoined or not). Hume's own discussion of 'causal connection' bears witness to this. He argues that we cannot know whether there is a necessary connection between any 'cause' and its 'effect', since we have no impression of any such. (34) But unless he already understood in what such a necessary connection consisted, he would not be in a position to deny our having an

impression of any. To point out that he found elsewhere an impression from which he was assured that the idea of necessary connection derived, (35) is not to contradict the foregoing. For the impression to which Hume traced the idea of necessary connection attributed to 'cause' and 'effect', is not a connection of the type, an impression of whose obtaining between 'cause' and 'effect' he denies. What he denies is that any necessary connection in virtue of which the existence of one is deducible from that of another, is discoverable between objects or events in their histories, by examination of impressions or images of them; while the impression which he finally postulates as the source of our idea of such a connection, is an experienced tendency or compulsion to pass from an idea of a certain type to one of another given kind.

(iii) The Discussion of 'Causation' and 'Causal' Inference in the Treatise.

(a) The Plan of the Discussion.

Hume's discussion of 'causation' and 'causal' inference appears in that part of the Treatise (36) entitled 'Of Knowledge and Probability'. This latter opens with a brief account of knowledge, in which the essence and basis of what one may call the negative aspect of his view of 'causation', is already made explicit. The remainder of this lengthy part is devoted to 'causation', 'causal' inference, and questions whose discussion is introduced in order to throw light on these former. Thus although explicitly devoted to 'knowledge' as well as 'probability', this portion of the Treatise is practically all concerned with a relation which, from the outset, Hume insists to be incapable of being an object of knowledge, and with beliefs resting upon its postulation.

It might seem surprising that he should give to a belief which cannot be certain, and to its object, so very much more attention than he bestows on knowledge and its object. There seem to be two reasons for his doing so. In the first place, the lack of amplification and justification in his account of knowledge, together with the confident assertion of its adequacy, (37) indicate him to suppose himself to be expressing therein a contention both familiar and indisputable to his contemporaries. Secondly, he recognises 'causal' relations to be the only ground for inferring the existence or activity of one thing, from that of another. (It is true that he first (38) distinguishes 'causal' relations as alone among those which are not

knowable, in constituting grounds for such inference; but later, (39) in defending their unique claim to this role, he argues that resemblance (to him a knowable relation) cannot fulfil it, which shows him to regard 'causal', as distinguished from all other relations, in this respect). Since on such inference depend so many beliefs and actions integral to everyday life, in addition to many beliefs formed by philosophers and scientists in their specialised capacities, its examination and that of its grounds are clearly of the utmost importance.

At a surprisingly late stage in his discussion, (40) Hume explains that while he bowed to tradition in entitling this part of the Treatise 'Of Knowledge and Probability', this is misleading in that it suggests all beliefs which are not knowledge, to be analogous. He insists that, while beliefs resting on 'causal' inference lack the certainty of knowledge properly so called; it is plainly ridiculous to suppose them no different from the expectation of a dice falling with six uppermost, when six is inscribed on four of its six sides, and the like. He points out that, in practice, we never doubt beliefs resting on 'causal' inference; whereas we think the other type of expectation, though more reasonable than not to entertain, may well be disappointed. He therefore suggests, as more consistent with common usage, the classification of inference as being from knowledge, proofs, or probabilities, as it rests respectively on deduction and intuition, the postulation of 'causal' connections, or on grounds on which no one supposes it possible to base infallible predictions. Hume, indeed, except where he is

directly asserting its lack of rational justification, assumes it reasonable to accept the conclusions of 'causal' inference, although he offers no justification for doing so; and in fact in directly discussing such inference adopts an use of the term 'reasonable' which would forbid its being applied to these conclusions.

The discussion of 'causation' and 'causal' inference is complex. It is liable to be confusing since it is not prefaced by an outline of its structure; and moreover the central discussion is intercepted by several subsidiary ones whose insertion Hume considers necessary.

The avowed aim of the discussion, as a whole, is to discover an impression whence the idea of 'causal' connection derives. (41) Hume starts a direct search for such an impression, only to be quickly brought to a standstill. (42). He therefore deserts it in favour of discussions which he expects to help its final satisfactory conclusion. (43) These subsidiary discussions concern why we suppose everything having a beginning to have a 'cause', and why we suppose a given particular 'cause' to have a specified 'effect', respectively. Even here his path is not straightforward. Having discussed the first of these questions until brought to the conclusion that belief in universal causation can be neither deduced nor intuited, but must be derived in some other manner from experience, (44) he does not then ask (as might be expected) how it is derived. Instead he avers that the answer to this will be best revealed by discussing the second subsidiary question, namely why we suppose a given type of 'cause' must have a 'given

type of 'effect'. (45). Discussion of this question, in its turn, proves complex; since for Hume it involves examination of the causes, nature and influence of belief, (46) besides arguments in support of the view that the only relation on whose basis we infer the existence or activity of one object from that of another, is that between 'cause' and 'effect'. (47) Furthermore, since Hume holds understanding probability inference (in the sense in which he distinguishes it from 'causal' reasoning) essential to comprehension of belief, a discussion of the former is included inthat of the latter. (48).

After considering all these subsidiary questions, Hume at last (49) feels equipped to complete his original search, to which he returns accordingly.

(b) The Nature of Knowledge.

Hume's account of knowledge rests on a conjunction of the rationalist conception with his analysis of mental processes terms of impressions and their images alone. He frames it by enumerating types of relation which may be known indubitably to exist, under given conditions; together with brief arguments to show these to be the only types of which this is true.

He starts by listing seven types of relation whose existence we assert: namely, 'resemblance, identity, relations of time and place, proportions in quantity or number, degrees in any quality, and causation'. (50) Of these, he says, only four - namely those of quality, quantity, contrariety and resemblance - 'can be the

objects of knowledge and certainty'. (51). And he affirms this to be so because these alone 'depend entirely on the ideas which we compare together'. (52) He shows his indebtedness to the mathematical conception of knowledge. (though himself no mathematician) by citing as an example the equality between the three interior angles of a trinagle and two right angles— discoverable, he avers from the idea of a triangle, alone and unchanged so long as that idea remains the same.(53) As an example, this is, perhaps, not the happiest choice since the discovery of this relation is inevitably somewhat complex. Furthermore, Hume's description is inadequate. To be precise, the equality between the interior angles of a triangle and two right angles, is deduced from the ideas of both sets of angles. It is true that both these ideas are comprehended in that of a triangle, which is conceived in terms of interior angles and straight lines; but the conclusion in question is derived from these ideas, not as conjoined in the idea of a triangle, but as distinct. Therefore although it is true to say that their equality is derivable from the idea of a triangle, insofar as by this is meant that they are derivable from ideas comprehended within that idea, that this is what is meant should be made clear if ambiguity is to be avoided. And when this equality is being cited as an example illustrating what is essential to a relation being object of knowledge, such precision is clearly demanded.

To say that we can know relations only when they depend on ideas may seem, at first sight, contradictory. For in ordinary usage 'mere idea' is opposed to 'objective fact', as something which apes a reality it does not possess; while to say of anything that it depends entirely on ideas, is to call it illusory or imaginary. There is, however, no evidence that Hume in describing a relation as dependent solely on 'ideas', intends to call it illusory, but rather the reverse. There is nothing to suggest that this is his meaning in the context in which he introduces the phrase, - he speaks of knowing mathematical relations, and those of resemblance, quality and contrariety, as though he supposes these to be anything but illusory. Moreover had he understood by 'a relation depending entirely on ideas', something illusory, at the same time maintaining that only such can be known; he would hardly have failed to draw the obvious conclusion that 'knowledge' is a logical impossibility, and have added this to the arguments he marshals in favour of scepticism. In fact, no such argument appears among them. He contends that the scope of our knowledge is much more limited than had generally been supposed by his predecessors, and that the ever present danger of invalid reasoning throws doubt even on the conclusions we suppose ourselves to have reached by mathematical reasoning; but he never argues the existence of knowledge to be self-contradictory. Indeed, as has been seen, he says relations of resemblance, quality, and contrariety, may be known, often intuitively and hence indubitably. (54).

Nor can Hume's assertion that only relations dependent solely on ideas may be known, be regarded as affirming knowledge to be possible only in abstract calculations, resting on man-made conventions. For, having just opposed 'ideas' to 'objects', (55) he proceeds to assert that we can often know resemblances and differences between objects, immediately.(56) And, again, he argues that a 'causal' relation cannot be known, by urging that 'the power by which one object produces another is never discoverable merely from their idea'. (57) Had he supposed knowledge inapplicable to concrete objects as such, he need have said simply that 'causal' relations may not be known because they would relate, not the concepts or symbols of an abstract system, but objects of everyday experience. This he says neither here nor in his fuller discussion of 'causation'.

It is true that he proceeds (58) to make explicit his denial that causal relations may be known, by concluding that they can be derived not from abstract reasoning but from experience. But this reveals merely the conviction that knowledge cannot be derived from experience, not that it can have no application to its content.

Hume's usage indicates that his phrase 'depend entirely on the ideas', in this context, derives from the ordinary use of the term 'idea', in the phrase 'to have an idea of', which treats 'to have an idea of X' and 'to understand X' as synonymous. For there seems no doubt, from the types of relations he asserts as knowable, his examples, and the general tone of his discussion of knowledge, that by a relation dependent 'entirely on the ideas which we compare', he means a relation such that to understand the natures of any two

existents so related is to know this relation to obtain between them. Today many philosophers hold that to 'understand' a geometrical conclusion to be entailed is simply to recognise an implication of a set of purely formal linguistic rules. But this view is of recent origin; to Hume's contemporaries, 'understanding' that the definitions of Euclidean geometry entail equality between the three interior angles of a triangle and two right angles meant understanding that if any existents (or parts of an existent) may, consistently with the definitions of that geometry, be described as the three interior angles of a triangle, they will be such that they cannot fail to equal, in respect of the number of degress they contain, any existents which (consistently with those same definitions) might be described as two right angles. And Hume shows no evidence of differing from his contemporaries in this respect. Furthermore, his brief accounts of types of relation which he regards as capable and incapable, respectively, of being known, support the above view of Hume's criterion for the knowability of a relation. Thus, of resemblance - a relation which, he affirms, may be known - he writes: 'When any two objects resemble each other, the resemblance will at first strike the eye, or rather the mind; and seldom requires a second examination'.(59) In other words, one has but to apprehend the characters of two resembling objects, to recognise that they are similar. On the other hand he has observed of 'relations of 'contiguity and distance' which, he avers, cannot be known, that they 'may be changed merely by an alteration of their place, without any change in the objects themselves',(60) which is to say that no matter

how adequate one's understanding of the nature of objects so related, it cannot suffice for the discovery of that relation.

To say so much and no more is, however, inadequate to make Hume's conception of knowledge, and the criterion of knowability, explicit. For my statement of his criterion would be interpreted differently by various philosphers. To many, 'understanding' or 'having an idea of' $\overset{X}{A}$ means knowing what would be the distinctive characters possessed by a given type of existent, in the sense of an ability to use correctly a linguistic rule directing that a certain name should be applied to anything possessing those characteristics. This is Hume's opinion, but he differs from most of those holding it since, owing to his identification of 'idea' and 'image', he supposes understanding the the nature of A to involve entertaining its image. Thus, when he asserts a relation's obtaining to be known only by its derivation from 'the ideas compared', he is asserting knowledge of relations to involve having images so related. It might be thought that, when Hume asserts that resemblance between objects immediately 'strikes the eye or rather the mind', he is affirming this relation to be discoverable directly from objects without the intervention of any images. But this, I think, cannot have been his intention. For it is evident that a resemblance between two objects would not be discoverable by inspection unless this were accompanied, or immediately followed by, an understanding of the nature of those characteristics in which they were similar. And for Hume, as has been seen, understanding A's nature involves having an image of A.

Unfortunately, Hume offers no account of the process by means of which we derive knowledge from ideas. Presumably he supposed the processes of intuition and deduction sufficiently familiar without further explication. Yet surely an account of knowledge based on these, and more especially an argument maintaining that there is no knowledge which does not rest on one or the other, is incomplete without a brief account of them. Moreover, when a philosopher is maintaining a view of ideas, which he admits, is not the common one, it is surely incumbent on him to explain these processes consistently with it; the more so when no previous attempt has been made to do this.

There are two cogent objections to the supposition that one cannot know A and B to be related without entertaining an image of either. Firstly, it is possible to reach such knowledge without possessing the corresponding images. Thus I may, and frequently do, make a valid mathematical calculation without the use of any images to which the symbols used are applicable; and, moreover, I do this whether my calculations are purely theoretical or are thought directly relevant to some particular numerable phenomena. I may, for instance, discover, with certainty, a relation of equality between 15+17 and 32, without forming images of groups of fifteen, seventeen, and thirty-two, objects respectively; and this is true even though my calculation be designed to discover, for instance, whether the contents of two boxes are equal in number, it being known that one contains thirty two oranges, and the other seventeen apples and fifteen pears. Even were it admitted that we originally

discover the applicability of the results of arithmetical calculation to objects such as apples, oranges, and pears, by means of such images, the possibility of obtaining knowledge of arithmetical relations, both in abstraction and as exemplified in given phenomena, without using them cannot be denied. Hume, indeed, argues in one place (61) that it is never possible to be certain of knowing arithmetical relations because of an ever present danger of mistaken calculation. I think, however, that consideration of arithmetic reveals that, though a mistake is always possible in the simplest calculation, arithmetical relations may be seen to be entailed.

In the second place, it is clearly contradictory to maintain a conclusion entailed by that in which they are alike to be discoverable from an exact copy of A or AB, but not from A or AB itself.

Hume's account of knowledge has been seen to be devoted entirely to the discovery of relations. This is to identify knowledge with the acceptance of justifiable assertions. For, as has been noted, (62) every statement capable of being understood by more than one person asserts a relation of resemblance, by using terms applicable in the same sense to more than one actual or possible existent. In this indentification Hume is not alone; many philosphers would dismiss as ridiculous the suggestion that anything incapable of linguistic expression could be known. But it is misleading when what professes to be an account of knowledge takes this identification for granted, as does that in the Treatise.

For, as has been observed, (63) our rules for using many sentences presuppose awareness of phenomenal characteristics independently of the use of language. And since, in other circumstances awareness is called 'knowledge', the title might, on this ground, be regarded as applicable to the consciousness of a phenomenon's character as distinct from the recognition of its similarity to that of others. And, indeed, the way in which what is described as 'knowing the character of 'a phenomenon,' knowing in what it consists', and similar phrases including the term 'knowing' in a like context, are regarded as a ground for deducing further conclusions concerning it, which are not simply assertions of similarity between it and others, shows this application to be accepted(at least implicitly) by many. Therefore, in making explicit a usage which excludes this, it is necessary to mention both its possibility and its rejection. Moreover, it is surely desirable for a philosopher adopting one of two possible alternative usages, of which the other is very commong, to offer some justification of his choice.

Although it is in some respects less clear than might have been wished, and in one of its crucial tenets patently mistaken, Hume's account of ~~know~~ knowledge is explicit on that point on which his denial of the knowability of 'causal'relations rests. For, as has been seen, he makes it clear that, in his view, to know a relation to obtain between A and B is to recognise them to be such that they cannot fail to be so related. And it is precisely because he is convinced that no such entailment of a 'causal'

relation between any two existents is discoverable, that he denies that the existence of such a relation is an object of knowledge.

It is, indeed rather surprising to find 'causation' already cited as a type of relation which cannot be known to obtain. For, that 'causal' relations can never be asserted with certainty is a contention one would naturally expect to find among the conclusions of an examination of 'causation' rather than in its introduction. And Hume is here, in fact, anticipating the conclusion of a future discussion. Since his contention is one which is disputed, it would have been preferable not to have introduced it as indubitable until it could conveniently have been defended as fully as possible; And such postponement would have been permissible in the Treatise since an account of the nature of knowledge does not demand an enumeration of all the types of relation which cannot be known; one example of these being sufficient to illustrate the contrast between them and those which are knowable. It is true that Hume offers a brief defence of his contention on its first appearance, and that this defence is essentially that which he offers subsequently at greater length. But it is merely stated bluntly, being neither amplified nor justified, as would be necessary to render it at all adequate. Nevertheless, the appearance of this contention in his account of knowledge, if somewhat premature, does at least serve to emphasise the relation between his view of 'causation' and his conception of knowledge, in Hume's thought.

(c) Hume's use of the term 'cause'

Hume's language, in opening his search for an impression whence derives the idea of 'causal connection', is misleading. For having affirmed the necessity of such a search, he continues: 'Let us therefore cast our eye on any two objects which we call cause and effect, and turn them on all sides, in order to find that impression, which produces an idea of such prodigious consequence'. (64) This reads as though his discussion is meant to concern anything to which one or other of the titles 'cause' or 'effect' is ordinarily applied. So understood, Hume's analysis is clearly inadequate. For he writes that he can find nothing common to, and characteristic of, 'causes' save contiguity and temporal priority to their 'effects'. (65) And it is easy enough to point to phenomena commonly called 'causes' which are both contemporary with, and spatially distant from, the 'effects' ascribed to them. Thus, to take but one instance, it has been seen (66) how, under certain circumstances, the title 'cause of a traffic jam' is (in accordance with a common usage) applied to an animal coexistent with, and distant from, this 'effect'.

It seems clear, however, that when Hume asks his reader to consider any two objects called 'cause' and 'effect', he does not literally intend him to consider <u>any</u> two objects of which one is said to be 'cause' of the other, but only pairs so described according to an usage which excludes some common applications of the term: and this for three reasons. In the first place it is highly improbable that he should have overlooked those usages

inconsistent with his analysis, had he intended to consider literally anything to which the term 'cause' is applied. Secondly, in defending the contiguity and temporal priority of 'cause' to 'effect' (67) he never argues that nothing is called the 'cause' of anything else unless it is both contiguous, and temporally prior, to this. And lastly, in defending the temporal priority of 'cause' to 'effect', he allows (68) that some suppose they may be simultaneous, which is to say that he recognises his account of 'causal connection' to be inconsistent with an accepted use of the term 'cause'.

Almost at the outset Hume declares (69) the idea of 'causation', whose source he is seeking, to be that of a necessary connection between 'cause' and 'effect'; and enters upon a lengthy discussion solely to reveal the source of this idea. Moreover, as has been seen, a large proportion of this discussion is devoted to the question why from a given type of 'cause' we expect one specific type of 'effect'. There seems, therefore, no doubt that throughout these discussions he is thinking solely in terms of the usage which became common among philosophers with the progress of modern sciences: namely that confining the title 'cause' to phenomena of a type there is good reason to suppose to have stood always in one specific relation with those of another given type (certain conditions having been fulfilled).

Unlike Kant, and most subsequent philosophers adopting this usage, Hume does not explicitly confine the term 'cause' to events; indeed, he generally refers to a 'cause' as an 'object'. (70) It

is true that an event may be regarded as an object of experience, but Hume (though explicitly identifying 'object' and 'impression', (71) which might suggest a different usage) ordinarily treats the unqualified term 'object' as applicable in contexts where plain men use terms like shoe, hat, etc., doing so, indeed, even where (72) he explicitly identifies 'impression' and object'. It has been seen, (73) however, that for one defining 'causation in terms of 'law' however conceived, this usage is far less convenient than one confining the title 'cause' to events. To take Hume's example, there is evidence of a far simpler correlation between A's approaching fire and his feeling heat, than can be postulated between the bare experienced existence of fire and the sensation of heat. Thus it seems reasonable to hold that whenever an event describable as a normal person approaching a fire occurs, a few simply specifiable conditions obtaining-such as his remaining conscious, that describable as his feeling a sensation of heat will follow; whereas many sets of conditions are possible, given which 'a fire's existence' may be experienced without heat being felt e.g. if I am standing in the snow looking through a window, I may 'see a fire' without feeling any warmth at all. Thus the subject of Hume's 'causal' analysis (as well as his basically phenomenalist account of experience, which directs attention particularly to its transitory elements) suggests the common modern usage.

(d) The First Part of the Direct Search for an Impression Whence Derives the Idea of 'Causal Connection.'

Once it is established that the 'idea of causal connection' whose origin Hume is seeking is that of a necessary correlation between types, and that when he speaks of a 'cause' and its 'effect' he is referring to phenomena of types there is good reason to believe to have been always similarly correlated; an adequate account and assessment of his discussions of 'causal connection' and 'causal' inference becomes possible.

The first part of Hume's direct search for the source of the idea of 'causation' is short, since, in his view, this search is early brought to a standstill, and must then be implemented by his discussion of 'causal' inference.

He starts by arguing that the required impression is no quality of 'cause' or 'effect' 'since, whichever of these qualities I pitch on, I find some object, that is not possessed of it, and yet falls under the denomination of 'cause or effect'. (74) Given his usage, this is to say that the idea of a necessary correlation between types as 'cause' and 'effect' cannot be derived from, or asserted in virtue of, any quality or qualities observable in them, since no one quality is found common to all types of phenomena there is good reason to suppose regularly correlated as 'cause' and 'effect'. He adds: (75) 'indeed there is nothing existent either externally or internally, which is not to be considered either as a cause or an effect: tho' tis plain there is no one quality, which universally belongs to all beings and gives them a title to that denomination'. This latter is

important, not merely as a defence of the conclusion under review, but also as evidence of Hume's belief that every phenomenon is regularly correlated with another as its 'cause' or 'effect'.

It is generally agreed that no characteristic (apart from their mutual relations) can be observed common to all phenomena reasonably to be supposed regularly correlated as 'cause' and 'effect', to those among them called 'causes', or to those called 'effects'. And many philosophers would deny any characteristic, other than regular temporal correlation with its 'cause' or 'effect', to be common to 'effects' and 'causes' respectively. That all 'causes' have a productive quality is either explicit or implicit in some philosophers' writing. And that all 'effects' share a quality of dependence has been seen to be commonly assumed (whether with consistency or not). But not even those who have, with consistency, assumed such a view of 'causes', or 'effects', or both, have supposed such qualities to be observable. For when, in defending their positions, they have in effect supported this view, they have done so by arguing it to be justly inferrible, not by maintaining a quality of productivity or dependence to be observable. For instance, an intrinsic quality of dependence in 'effects' has been argued, on the ground of their non-existence in the absence of given conditions, (or one of a limited number of alternative sets of conditions).

For Hume, as has been seen, (76) to assert a quality to be unobservable is to say there is no justification for postulating

its existence. It has also been seen that his attitude to unobservables rests on his conception of understanding in its relation to images, and that this latter is unjustified. If therefore the postulation, or assumption, of qualities of productivity and dependence in 'causes' and 'effects', respectively, is to be justly condemned, its rejection must rest on other grounds than those which served to convince him.

Hume's belief that he has shown the idea of 'causal' connection to derive from no quality of 'causes' or 'effects', by arguing that neither exhibit a characteristic quality, rests on his view that an idea is derived from an impression solely as its copy. It has been seen, (77) however, that it is possible 'to have an idea of X' in the sense of 'understanding' it, without entertaining its image. There is, therefore, nothing to prevent the derivation of an 'idea' in the sense of 'understanding', independently of copying an impression; and indeed, in denying the possibility of discovering necessary connection between 'cause' and 'effect', Hume has been seen (78) to 'have an idea', in this sense, whose derivation from an impression as its copy he emphatically denies (though he does not admit this). The idea of 'causation' might, therefore, be derived from a quality of a phenomenon, could this be shown to entail its being 'cause' or 'effect' (as the case might be), even though that idea could not be regarded as a copy of the quality in question. To justify Hume's denial, therefore, it would be necessary to show the idea of 'causal' connection to derive from no quality of phenomena, whether as its copy or not.

Hume's restricted view of the derivation of ideas accounts for his belief that in contending that 'causal' connection ought not to be inferred from any quality of phenomena, he is denying its being in fact so derived. For if an idea can be derived from an impression only as its copy, then it is not merely illegitimate, but impossible, to derive one from an impression resembling neither it nor its elements.

Once reject Hume's conception of the origin of ideas, however, and one must regard the question of an idea's source, and that of the justice of its derivation therefrom, as distinct. For it is not impossible, and sometimes not even difficult, to be mistaken concerning the implications of possessing a given quality. Indeed, a quality may well be wrongly attributed. It is, therefore, possible that the idea of 'causal', in the sense of necessary connection, might be derived mistakenly from a quality justly attributed to a postulated 'cause' or 'effect', or with logical precision from a quality wrongly attributed to either.

Having denied the derivation of the idea of 'causal' connection from any quality of 'cause' or 'effect', Hume proceeds to examine their mutual relations in order to reveal whether its source is to be found there. He treats this question similarly to the last, regarding it as asking whether or not any relation can be found obtaining between all 'causes' and 'effects' in his sense of the term.

As has been already remarked, (79) he argues that two relations always obtain between a 'cause' and its 'effect'; that a 'cause' is always contiguous with its 'effect', and that it always precedes the latter in time. I shall discuss the postulation of these relations in the order in which he enumerates them.

A. The Contiguity of 'cause' and 'effect'.

Hume thinks the contiguity of 'cause' and 'effect' both self-evident and 'universally acknowledged'. He therefore regards its assertion as requiring no further defence than the remark: 'Tho' distant objects may sometimes seem productive of one another they are commonly found upon examination to be linked by a chain of causes, which are contiguous among themselves, and to the distant objects; and when in any particular instance we cannot discover this connection we still presume it to exist;'. (80)

Before discussing Hume's contention, it may be well to make his definition of 'contiguity' explicit since the term is not always used in his sense. It is generally agreed that to assert A and B to be contiguous is to deny their being continuoua one with another. And Hume is no exception to this general rule, since his conceptions of time and space preclude his ascribing either temporal or spatial continuity to existents. But beyond this, agreement is not so complete. Broad (81) for instance, uses the term in a sense in which to say A and B are contiguous is to say that no existent intervenes between them though they may be divided by an interval. For he asserts it to be possible to

assume physical straight lines to be composed of 'contiguous points very close together'. (How an interval between points could escape being spatial and so containing points, he does not explain). Hume, however, leaves no room for supposing that he uses the term in this sense: at the outset he enlarges his contention that a 'cause' is always contiguous with its 'effect', with the words 'nothing can operate in a time or place which is ever so little removed from those of its existence.' It is thus clear that for him, to say A and B are contiguous, is to say that though they are not continuous there is no interval between them. Since it is Hume's contention I am discussing, in what follows I shall naturally use the term as he does.

Hume supposes a 'cause' and its 'effect' to be always temporally related, but is prepared to postulate 'causal connection' between existents which could not be spatially related (e.g. flame and the sensation of heat). His contention that there can be no spatial or temporal interval between a 'cause' and its 'effect', therefore, amounts to saying that there is no temporal interval between any 'cause' and its 'effect', while whenever a 'cause' and its 'effect are spatially related there is no spatial interval between them either.

Hume's attribution of temporal (and, where appropriate, spatial) contiguity to 'cause' and 'effect' is demanded by two of his convictions, namely: a) that there is no interval between a 'cause' and its 'effect'; and b) that time and space consist of contiguous non-extended units.

His attribution of spatial contiguity to spatially related 'causes' and 'effects' has received very little notice from subsequent philosophers. There are two reasons for this. In the first place, they, like Hume himself, have been prepared to apply the titles 'cause' and 'effect' to existents between which there is no spatial relation; and so have regarded spatial relations as not integral to 'causal connection', and therefore unimportant to its discussion. Secondly 'causal laws' (relating to the motion of planets and other heavenly bodies) inconsistent with Hume's dictum, have, since his time, been universally accepted. It has therefore appeared so obviously false to his successors as to need, and indeed be worthy of, no comment. Broad, however, writes (82) that: 'For a person who was so convinced of the value of Newton's law of gravitation as to wish to introduce something like it into the mental world the statement of contiguity with regard to space seems an odd one'.

Since, for most of Hume's successors (in Britain at any rate) temporal relations are integral to 'causal connection', his assertion of temporal contiguity between 'cause' and 'effect' has, on the other hand, received more attention. This also is generally denied today because the conception of time on which it rests is rejected. Indeed, regarding it, Broad thinks it sufficient to remark (83) that it is to be rejected because inconsistent with the continuity of time. Russell and Kneale both suppose the dismissal of Hume's doctrine to need further implementation. But the argument's of both (84) rest on the

view of time as continuous which Hume rejects. Russell and Kneale were probably justified in supposing this view needed no justifying to the modern reader; and as each was concerned with Hume's doctrine only as it is relevant to presenting a definition of 'causal connection' as acceptable to the modern reader, they were justified in acting thus. But in a discussion intended to throw light on what Hume wrote, and why he wrote it, such summary dismissal would be inadmissible.

Hume's conviction that time and space are composed of contiguous indivisible units rests on the Leibnizian principle, that only the completely simple can truly be said to exist, a compound or aggregate existing solely in virtue of the existence of the simples of which it is composed. (85) One does not need to be a Leibniz, however, to see Hume's conclusion to be inadmissible. For clearly whatever is extended is composed of extended parts, and whatever has duration has parts also possessing it; since it is self-evident that the addition of something unextended to something unextended cannot constitute anything extended, and similarly that the addition of the durationless to the durationless cannot form anything having duration. But to have duration, or to be spatially extended, is to be divisible in that respect; hence whatever has duration or spatial extension is, in that respect, infinitely divisible. From Leibniz's premise, therefore, Hume would have been justified only in drawing, with regard to both duration and spatial extension, the conclusion which Leibniz drew with regard to the latter; namely that it is not properly attributable to anything real.

Hume offers an additional argument against the infinite divisibility of time: 'Tis a property inseparable from time, and which in a manner constitutes its essence, that each of its parts succeeds another and that none of them, however contiguous, can ever be coexistent..... if in time we could never arrive at an end of division, and if each moment, as it succeeds another, were not perfectly single and indivisible there would be an infinite number of coexistent moments or parts of time;'. (85) This argument evidently rests on the belief that if a complex is successive each of its components must be successive with all the others. But the infinite divisibility of time entails no coexistence of its parts, beyond the impossibility of its having any section, some of which does not coincide with part of another. The falsity of Hume's premise is sufficiently evident. That every component of a compound is successive with every other, is not entailed by each of its components being successive with some others so that the whole constitutes a succession. And indeed there are many successions some of whose members are not successive with all the others. A piece of music, for instance, is essentially a succession of notes, yet most pieces of music contain many notes completely contemporary with others. And there are many successions parts of which are not successive with certain others because contained in, or containing, them. For instance, the experience of reading a poem is a succession of experiences of reading verses, each in its turn divisible into successive experiences of reading words, so that not all the experiences of reading words which it contains are successive with

all those of reading its verses.

Indeed, were Hume's view of succession correct, none could contain more than two parts, even though these were indivisible. For whatever is divisible into more than two successive parts contains at least one composed of two lesser sections. Hume's view is thus plainly refuted by experience, in which, as has been seen, there are many successions containing more than two members. And it is equally inconsistent with his own conception of time as a large number indivisible units. Indeed, it is inconsistent with any conception of time compatible with ordinary usage, for the term is commonly applied to a succession divisible into many parts, so that it is generally agreed, for instance, that 'today' and 'this afternoon' are both parts of time which are not mutually successive because the latter is contained in the former.

Since duration and spatial extension are both infinitely divisible, the only temporal or spatial indivisibles which can be postulated are limits of duration and extension respectively (and these are clearly abstractions). And, again owing to the infinite divisibility of duration and spatial extension, there are no two limits of duration, and no two limits of spatial extension, between which there is not another.

Nor can anything having duration be temporally, nor anything having spatial extension be spatially, contiguous with another. For since whatever endures or is spatially extended is, in that respect, infinitely divisible: nothing so extended contains a part which can properly be called 'next to' anything beside it

in time or space respectively.

Both Russell and Kneal point out that neither the temporally indivisible, nor the temporally divisible, can be contiguous. (87)

Clearly none but limits of time, durations, and existents having duration, can be temporally related, and none but limits of spatial extension, spatial extensions, and existents having spatial extension can be spatially related. Hence if nothing of any of the first three types can be temporally contiguous with anything, and nothing of any of the last three can be spatially so; no two existents can be contiguous one with the other. Hume's position is thus unjustified since he adopts a definition in accordance with which a 'cause' is always at least temporally contiguous with its 'effect, while at the same time supposing there are existents to which the titles 'cause' and 'effect', so defined, are applicable.

Hume's contention that nothing, not even an interval, can intervene between a 'cause' and its 'effect', seems to be an heritage from the Aristotelian belief that an 'efficient cause' never achieves its 'effect' save by contact with that which it affects. Hume's conclusion that there is no objective connection between a 'cause' and its 'effect' save a relation of succession which, it is reasonable to suppose to have always obtained betwen phenomena similar in type, however, not only does not entail this conclusion, but (if true) renders it unjustifiable. For there is no contradiction in supposing two types of phenomena to succeed each other regularly, other phenomena intervening between them.

Moreover, there is good evidence that some such regular successions have at least occurred constantly in the past. For instance, there is good evidence that whenever a fuse of a given length attached to a bomb has been lit (certain other conditions having been fulfilled), an explosion has followed after a time interval the length of which has been constant in each instance. And, indeed, if Hume is correct in supposing experience to consist in a series of impressions and ideas, each of which follows its predecessors in accordance with a rule observed and repeatedly exemplified throughout the series, there must exist numerous regular successions of this type. Most people (whether philosophers or not) would, I think, reject the suggestion that between two successive existents there might be a time interval in which nothing existed. But since Hume supposes that we have no rational justification in supposing any one experience dependent on its predecessor, and hence for him there is no essential difference between one thing coming into existence after another and something beginning to exist after an interval, he has no justification for joining in this general rejection. The existence of things separated by empty space does not present the difficulty raised by the suggestion of existents separated by empty time, for it does not involve something coming into existence 'from nothing'. It is, indeed, at least possible that there is empty space between the planets and other heavenly bodies (or at least between them or any gases immediately surrounding or adjacent to any of them); and that this is so has been given no

little probability by the failure of repeated attempts to disprove it.

It is probable that Hume maintained the inseparability of 'cause' and 'effect' in spite of its inconsistence with his account of 'causal connection', because he supposed it implicit in the scientifico-rationalist usage; since he intended his discussion of 'causation' to be concerned with the interpretation of the term as used in accordance with this. The assertion would then, in effect, constitute part of the definition of the usage with whose interpretation he is concerned, and so be legitimate to him. That an ardent exponent of Newton's theory of gravitation should have supposed the inseparability of 'cause' and 'effect' integral to scientifico-rationalist usage, may at first sight seem a surprising suggestion. But it will seem much less so when it is remembered that Newton himself found the notion of action at a distance hard to accept, (88) and that for two centuries after the publication of his Principia, scientists were trying to discover a material medium connecting the planets and other heavenly bodies one with another.

(B) The priority of 'cause' to 'effect'.

Hume regards his contention that a 'cause' is always prior to its 'effect' as lacking the 'universal acknowledgment' (89) he attributes to the assertion of contiguity between 'cause' and 'effect'. He therefore thinks it more in need of defence than the latter, and accordingly attempts its vindication.

Presumably it was because he supposed the contiguity of 'cause' to 'effect' generally admitted, but not the priority of the former to the latter, that he postulated the relations in this order. For it is neither the more convenient nor the more reasonable, since one must know he thinks a 'cause' always prior to its 'effect', before understanding precisely what he is asserting in affirming their contiguity. Indeed, since only those accepting Hume's doctrine of the priority of 'cause' to 'effect' are justified in asserting their contiguity, in his sense of the term, the order he adopts could not be justified even by the policy of putting less controversial points first.

Hume bases his defence of the priority of 'cause' to 'effect' on what he describes as 'an established maxim both in natural and moral philosphy'; namely 'that an object which exists for any time in its full perfection without producing another, is not its sole cause; but is assisted by some other principle which pushes it from its state of inactivity, and makes it exert that energy of which it was secretly possest'. (90)

Hume's couching his account of this maxim in language appropriate to the activity view of 'causation' alone is, to say the least, surprising: and, as Broad remarks, (91) is hardly justified in view of his final account of 'causal' connection. Although, in this, however, his choice of language is unfortunate it cannot, I think, be regarded as a major inconsistency. For it seems evident that in this instance, he has, for convenience, used the language his contemporaries would have used in a similar context,

without any intention of committing himself to the account of 'causation' which it ordinarily suggests. His description of 'causes' as 'operating' and 'productive', in postulating the contiguity of 'cause' and 'effect', (92) is doubtless similarly explicable. Such use of common terms cannot be condemned outright since it would often be very inconvenient for philosphers to avoid it. It would, for instance, involve needless trouble if a phenomenalist could never use the term 'physical object'; but had instead to replace it-either by a specification of the types of collocations of sensa, or possibilities of sensation, which may be postulated when the term is used correctly according to the ordinary conventions, or by some other term invented or coined in order to denote this. Hume's wording of his maxim, cannot be justified on the basis of convenience, however, since he could, with very little trouble, (indeed more simply), have expressed it consistently with his account of 'causation'.

Even when not stated in terms proper to the activity view of 'causation' alone, the tenet that a 'cause' cannot exist for any period of time without its 'effect', is inconsistent, not simply with Hume's final account of 'causal connection', but with one of his most fundamental premises.

It has been seen (93) that basic to Hume's philosophical position in general, and to his discussion of 'causation' in particular, is the conviction that we can conceive only that which, or whose component parts, we have already experienced; and that, in consequence, we are not justified in postulating the

existence of anything not fulfilling these conditions. But it has also been remarked (94) that there is good ground for thinking we can experience nothing lacking duration, which is to say it is reasonable to suppose that no human being has experienced the momentary existence of one thing in the absence of another followed by their coexistence, which is the relation Hume's maxim asserts as holding between every 'cause' and its 'effect'.

Nor is there any inherent contradiction in the notion of a constant correlation such that whenever an A has existed for a given period of time (certain conditions having been fulfilled) a B has come into existence. There is, indeed, evidence that correlations of this type have existed: for instance there is evidence for supposing that whenever a time bomb has existed unchanged for a given period, certain conditions having been fulfilled, (a 'time bomb' being here treated as distinct from its fuse), an explosion has occurred.

There is, however, equally good evidence for thinking that whenever such correlations have occurred, changes constant in type have taken place throughout the interval, and have been regularly related to that which followed. If, therefore, like Hume one admit the postulation of momentary states, one must think it probable that there is no regular succession not reducible to a constant sequence of such states. But this conclusion could not justly be thought certain, given the regularity view of 'causation'; since it could rightly be so regarded, only if the necessary dependence of any change on something preceding it could be supposed certain. And

it is the essence of the regularity view to deny the existence of any adequate ground for such a supposition. Therefore, had Hume maintained his final account of 'causation' without his theory of conception, he might with consistency have regarded this modification of his 'maxim' as probably true. But since he would not have been justified in thinking its truth more than probable, he could not justly have treated it as a ground for attributing certainty to any other conclusion.

Probably Hume's denial that a 'cause' can exist for any time without its 'effect' amounts (as I have suggested his statement of their contiguity to do) to part of the definition of the usage he is discussing. If this is so, his argument against the possibility of simultaneous 'causation' is, in effect, simply a demonstration of the inconsistency of its assertion with that usage. But as his own account of 'causal' connection is intended to be consistent with that usage, it could not ~~logitately~~ legitimately conflict with what he regarded as demanded by this, or the arguments he used to prove this to be so.

Even were Hume justified in denying that a 'cause' can exist for any time without its 'effect,' the argument by which he deduces from this that all 'causation' is successive would stand condemned.

He frames his argument thus: 'if any cause be perfectly co-temporary with its effect, 'tis certain according to this maxim (i.e. that no 'cause' can exist for any length of time with out its 'effect') that they must all of them be so; since

any one of them which retards its operation for a single moment, exerts not itself at that very individual time in which it might have operated; and therefore is no proper cause. The consequence of this would be no less than the destruction of that succession of causes which we observe in the world; and indeed, the utter annihilation of time. For if one cause were co-temporary with its effect, and this effect with its effect, and so on, 'tis plain there would be no such thing as succession, and all objects must be co-existent'. (95)

As Broad points out, (96) this argument is not only formally invalid, but also involves an assumption inconsistent with Hume's position.

It contains the inference that all causes are simultaneous from the premises 'No cause exists for any length of time without its effect also existing', and 'Some causes are contemporary with their effects': premises from which no conclusion concerning 'all causes' can legitimately be drawn.

Moreover, it implies that from Hume's maxim that no 'cause' exists for any length of time without its 'effect' existing also, may be inferred that if A is contemporary with B, B's effect' must be contemporary with A. But this conclusion may be legitimately inferred from that maxim, only if it is also held that one existent cannot succeed another unless that other exists for some length of time. And this latter belief is clearly inconsistent with the view which Hume so paradoxically supposes himself to be defending - namely that a 'cause', while

never existing for any length of time without its effect, always precedes that effect.

Aginst Hume's assumption that his maxim involves the simultaneity of an 'effect' with anything contemporary with its 'cause', Broad urges simply its inconsistency with his conception of time as composed of contiguous moments. This inconsistency is evident, and is indeed implicit in the inconsistency of that assumption with Hume's conception of 'causation'. It is, however, not only more convenient, but also necessary to point rather to the latter inconsistency.

It is more convenient since, as Hume nowhere explicitly asserts the indivisible components of time, which he postulates, to be durationless, the only certain evidence that this was his view being his conviction that a 'cause' may precede its 'effect' without existing for any length of time without it; Hume's assumption's in-consistency with his view of time can thus be demonstrated only by reference to that in his view of 'causation' which it contradicts. Broad, indeed, nowhere defends the contention that the time units Hume postulates are moments. Presumably he thinks that Hume's supposing them to be indivisible amounts to his thinking them durationless, since it is obvious that whatever has duration is divisible. But this supposition has no justification. For it is equally obvious that the parts of a duration must themselves have duration, yet Hume's explicit assertions concerning time are inconsistent with the truth of both these obvious tenets, and, as has been seen, his view of 'causation' is inconsistent

with the second.

And it is essential to show this assumption to be inconsistent with that view of 'causation' which it is used to defend. For if a philosopher's defence of a given conclusion is inconsistent with some tenet he has maintained concerning time (or anything else), which is irrelevant to that conclusion, it is always possible that that tenet is indefensible, and the argument inconsistent with it, sound. Whereas an argument involving the falsity of the very conclusion it is intended to demonstrate is intrinsically indefensible.

The only defence of his contention that a 'cause' is always prior to its 'effect', which Hume offers, is thus untenable on two grounds.

It is, of course, possible that Hume's contention might be true although he failed to establish this. One is not, therefore, entitled to reject it in rejecting his defence of it; I shall, accordingly, discuss it on its own merits before leaving the subject. I shall naturally discuss Hume's contention as he understood it; that is to say I shall confine myself to asking whether there would have been any contradicition in his supposing experience consistent with the truth of laws connecting contemporaries, and whether he might be supposed to have had any adequate grounds for thinking it so. Hume denies both the existence of any objective connection between existents save correlation consistently with a rule, in the sense of a pattern there is reason to suppose constantly exemplified in the past; and the possibility of rational justification for prediction.

My questions amount, therefore, to asking whether there is any contradiction in supposing a constant correlation, such as the simultaneous existence of an A whenever a B has existed, to have occurred in the past; and whether there are any adequate grounds for supposing any such correlation to have in fact obtained.

From the conjunction of Hume's maxim with the principle that if A succeeds B the latter must exist without A for a length of time however small, Lotze argues (97) correctly that all 'causation' must be, not successive, but simultaneous. But, like Hume, he ~~also~~ supposes the existence of simultaneous 'causation' would preclude succession. He examines the possibility of two contemporary series, to every member in each corresponding one and only one in the other, each member of one being 'caused' simultaneously by the corresponding member of the other. But he thinks such a combination of simultaneous 'causation' with succession to be impossible. For he supposes that because it would involve a fixed order in that succession, it would also entail the dependence of one momentary state on that next preceding it; and since he holds time to be continuous he cannot admit adjacent moments. It was seen, however, that there was no contradiction in postulating constant correlation between separated existents, but rather that there is good evidence for supposing, at least, that such correlations have existed in the past. (98) Lotze's argument may therefore be rejected in the present context for the reason which leads Broad to reject it; (99) namely, the untenability of the principle of the inseparability of 'cause' and 'effect' on which it

rests.

There is, indeed, no intrinsic contradiction in postulating a constant correlation such as the existence of an A whenever a B has existed. For there is nothing in the nature of existence to exclude simultaneity, and ~~as~~ nothing in the nature of either constancy or correlation entailing their restriction to successive existents alone. Indeed, there is good evidence for postulating the existence of many such correlations. There is, for instance, good ground for supposing that whenever the characteristic of being a ruminant is discoverable in an animal, that of being cloven-footed is also; and that whenever water is boiling where the air pressure is that normal at sea level and there is a centigrade thermometer in good condition standing in it, the latter registers a hundred degrees. Only the second of these two correlations would be normally called 'causal', though there is no reason for refusing the title to the first unless 'causation' is not defined in terms of correlation alone.

As Broad points out, (100) it is never absolutely certain that the apparently simultaneous are really contemporary, since it is always possible that they may be separated by a time interval too small for us to perceive. That they are so separated is, however, highly improbable in most instances where simultaneity is commonly postulated. It is, for example, improbable that when we think we observe water boiling and a thermometer registering a hundred degrees, what in fact occurs is a rapid succession of changes in water and thermometer so that the boiling condition in the one,

and the registering a hundred in the other, are in fact always successive. The only evidence which could support the assertion of such a succession, namely its observation, is, from the nature of the case, unobtainable. Moreover, the only evidence which would support the view that water ever boils where there is ordinary sea-level air-pressure when a centigrade thermometer in it does not register a hundred degrees, or that such a thermometer ever registers this temperature when in water which is not boiling where that air-pressure is found;, is the observation of such a conjunction. And all the available evidence indicates this to be precisely what has never been observed. As it is clearly unreasonable to postulate something for which there is no evidence, one should, therefore, affirm the existence of the constant correlation of contemporaries, not indeed as certain, but as an hypothesis which it is more reasonable to accept than to reject.

Since, however, Hume intended his discussion of 'causation' to be an examination of the interpretation of that term as used by the scientific rationalist, he would have been justified in insisting on defining it so as to exclude simultaneous 'causation' had he been able to show this definition to be either implicit in, or more reasonable than not, given, the basic premises of the scientific rationalist. But this he does not attempt to prove, nor could he have done so.

It will be seen below (101) that if anything having a beginning is 'caused' in the determinist sense of being inevitable, at least one factor contributing to its entailment must exist

before it. To show therefore that a definition excluding simultaneous 'causation' is demanded by the scientific-rationalist position, which regards many phenomena having a beginning as 'caused' in the determinist sense, it would be necessary to prove either that a determinist could consistently call only an entailing factor preceding it 'cause' of anything, or that he would be most reasonable in so restricting his application of the term.

Hume himself has been seen to admit, or at least to imply (102) that determinists do not all take this view; nor could this justly be disputed. The determinist would, for instance call its temperature where there is a given air-pressure, the cause of water boiling, rather than its being placed on fire or stove in kettle or pot; though he would hold both that its boiling never followed this event save necessarily, and that there are many occasions when its occurrence is indispensable to water boiling. And clearly this usage is the most convenient for any one wishing to regard a connection between 'cause' and 'effect' as a basis of inference, as the scientific rationalist evidently does. Certainly it is as reasonable to suppose that (under given conditions) placing a kettle of water on a stove has been regularly followed by the water's boiling, as it is to hold that water has always boiled at a specified temperature where there is a given air-pressure. But a law specifying the former would be far more complex than one stating the latter, since there are many conditions given which placing a kettle of water on a

stove is not followed by the water's boiling. Furthermore, the correlation between its temperature and the air-pressure present to it, is the one factor which has been found common to all instances of water boiling.

From this it is clear that circumstances are conceivable under which it would be reasonable to apply the title 'cause of A' to a simultaneous factor contributing to its entailment. And it is further evident that if there is any justification for supposing the existence of many phenomena to entail that of others (or to do so in conjunction with other conditions), there is equal justification for postulating the existence of an entailing factor simultaneous with that which it helps to entail. For there is reason to suppose a constant correlation to have always obtained between its having a given temperature where there is a specified air pressure and water's boiling; which is the only ground we have for postulating entailment between many phenomena which the scientific rationalist thinks so related. He should hold, therefore, not only that one of two simultaneous existents might be called 'cause' of the other, but also that there are simultaneous existents one of which may reasonably be called 'cause' of the other.

Before closing this section, I shall briefly discuss the doctrine that 'causation' is always successive, in terms of other definitions of 'cause'.

In the first place, it is clear that nothing can exist prior to anything without a beginning. Therefore to be consistent,

anyone maintaining 'causation' to be always successive should also either (a) adopt and adhere to a definition in accordance with which only that having a beginning could be said to be 'caused'; or (b) while adopting another definition, hold there is at least good ground for denying the existence of anything without a beginning which can properly be said to be 'caused'.

Again, it is obvious, that if one holds the title 'cause' to be applicable only to continuants, supposing at the same time that an 'effect' begins to exist in virtue of its 'cause's' activity as a work of art is ordinarily thought to do, then one should hold that a 'cause' must exist before its 'effect'. For this view amounts to the belief that a 'cause' must act, and therefore exist, before its 'effect' can come into existence.

Or if, like Berkeley, one thinks only conscious purpose can properly be called a 'cause', holding an 'effect' to be deliberately brought about in order to fulfil a purpose, one must equally suppose all 'causation' successive. For clearly (given the ordinary sense of the terms) no one can deliberately set about fulfilling a purpose without first entertaining it.

On the other hand the contention that 'causation' must always be successive is inconsistent with the view that, though a 'cause' is always indispensable to the existence of its 'effect', there are 'causes' which do not, under any circumstances, entail some of the 'effects dependent on them. For this view allows some 'causes' to entail their 'effects' (or at least to do so under certain conditions); and as has been seen, it may be reasonable

to apply the title 'cause' to an entailing factor simultaneous with that which it entails or helps to entail. And similarly, since, as has been seen, if it is reasonable to call many phenomena 'cause' in the entailment sense, it is reasonable to call some existents 'cause' of others simultaneous with them; one holding this view, like one holding the entailment view, must either suppose we cannot know the term 'cause' to be applicable to many phenomena or else believe that there are simultaneous existents one of which may reasonably be called 'cause' of the other. And those holding the 'indispensability view' (if I may so term it), like those holding the entailment view, do not usually wish to regard the term 'cause' inapplicable to any particular phenomenon.

I think no one has maintained both that a 'cause' is always indispensable to its 'effect', and that no 'cause' entails (or helps to entail) its 'effect'. Certainly no one prepared to regard many given phenomena as 'causes', in the sense of being indispensable to others, could consistently maintain that no 'cause' entails its 'effect'. For whether one regard any phenomenon as an entailing 'cause' or as one which is indispensable to its 'effect' without entailing it, one is postulating an entailment between phenomena. Therefore precisely the same type of evidence would justify one in regarding any phenomenon as 'cause' in either of these senses. And the only evidence we have for many of the dependences ordinarily postulated between phenomena, is that for the non-occurrence of the postulated 'effect' in the absence of

that regarded as its 'cause'.

If, however, anyone did suppose 'causes' always indispensable to, but never to entail, their 'effects', he could have neither a priori, nor empirical, justification for thinking 'causation' always successive. He could have no a priori ground for doing so, since being an indispensable non-entailing conditions of A does not imply existing prior to A. There is, for example, no contradiction in supposing certain simultaneous conditions to be indispensable to an electron's moving in a given way without entailing its doing so.

And should anyone be so inconsistent as to take constant conjunction as evidence of a phenomenon's being an indispensable, but not of its being an entailing, 'cause'; then he would have to admit the existence of indispensable conditions (e.g. the temperature of water at boiling point) which are simultaneous with the 'effects' dependent on them.

Aristotle thought there was a sense in which each of his 'four causes' could be said to precede its 'effect'. Doubtless this was due to his regarding chiselling, or casting, statue or bowl as the type of 'causation'. For clearly when anything is chiselled, or cast, from stone or metal respectively, what Aristotle would call its 'efficient' and 'material causes' exist before it. Further, he supposed that anyone making a statue or bowl, does so deliberately; and, as has been seen, if this is so, his 'end', in the sense of conscious purpose, must exist before he starts fulfilling it. Again, in order to have a conscious purpose to make anything, one must at least understand its nature either before, or

concomitantly with, forming that purpose. Indeed the supposition that forming such a purpose is accompanied, or preceded, by the entertainment of an image of that which it is purposed to make, is not unsupported by evidence. Certainly many claim to have such an image when having the experience ordinarily described as consciously intending to make something.

It has been seen, (103) however, that, in the sense consistent with Aristotle's explicit definition and most common usage, a 'formal cause', as such, is inseparable from its 'effect'.

It should hardly be necessary to add that since Hume is prepared to apply the term 'cause' to 'objects' such as flames, chairs, and tables, his contention that 'causation' is always successive can be regarded as asserting only that a 'cause' always exists prior to its 'effect', and not as denying their ever being co-existent.

(C) Conclusion of the first part of the direct search.

Hume declares no relations, save contiguity and priority to their 'effects', to be found common to all 'causes'; the only relations discoverable as common to 'effects' being, therefore, contiguity and succession to their 'causes'.

He rejects the definition of 'causation' in terms of 'production' as tautologous. Its being so or not, of course, depends on how 'production' is defined; Hume seems to be justified, however, in supposing the two terms commonly treated as synonymous by those holding the activity view of 'causation'.

He refuses to define 'causation' in terms of succession and contiguity alone, because he recognises that: 'An object may be

contiguous and prior to another without being considered as its cause'. (104) He is here referring to simple succession, not regular sequence, so this assertion is not a denial of the 'regularity view of causation', as the context in which Kemp Smith quotes it (105) seems to suggest (though admittedly he has previously said that for Hume 'causation is more than sequence, and more also than regular sequence).

Hume's account of 'causal' connection, as will be seen, is not simply that known as the regularity view, which confines itself to an account of the relations holding between 'cause' and 'effect'. For Hume finds his aim of discovering the source of the idea of 'causal' connection demands analysis of the psychological factors present whenever 'causal' connection is asserted. But his account of our knowledge of that connection supports the regularity view; and nothing which he says about the psychological factors involved contradicts it. He differs from exponents of the regularity view in one important respect, however. To these latter, the scientific rationalist's assertion of necessary connection between 'cause' and 'effect' is important merely as something to be discredited. Thus to many, their arguments appear preposterous in that they urge discarding beliefs (such as the necessary succession of death on the taking of arsenic under certain conditions) which seem psychologically inescapable. Hume, on the other hand, is concerned primarily, not with criticising the scientific rationalist conception, but with discovering its source; and is, moreover, more than ready to regard it as intrinsic to human thought. Accordingly

he announces his intention of turning from the examination of particular 'causes' and their 'effects', precisely because this does not reveal the required impression of necessary connection. He concludes this section, therefore, by asserting that he will examine certain beliefs about 'causation' in order, by this means, to show at length where such an impression is to be found.(106)

(e) Can we be certain that whatever has a beginning must have a 'cause'?

(A) Possible interpretations of the question.

As has been seen, the first subsidiary question which Hume introduces concerns why whatever has a beginning is held to have a 'cause'. This supposition Hume describes (107) as 'a general maxim of philosophy', a description of which he seems particularly fond.

My calling this question subsidiary may seem startling, since it forms the subject of so large a proportion of discussions on 'causation'. In so describing it, however, I intend to deny neither its importance, nor its being fundamental (at least on one possible interpretation) to a great deal of philosophy. I am merely describing its function in Hume's discussion, the main object of which is to discover what the scientific rationalist is (or ought to be) talking about when he uses the term 'cause'. And, indeed, it is not difficult to see Hume's central query to be the more fundamental of the two; for clearly one cannot hope to discuss intelligibly whether everything having a beginning has a 'cause', until one has defined the latter term.

The belief that everything is explicable, in the sense that there is something indispensable to its existence, has been observed (108) to be both very common, and fundamental to much that philosophers have maintained; its consistent denial having been seen to be very difficult. It is a corollary of this principle that if anything has a beginning so that its existence cannot be intrinsically necessary, that existence must depend on something external to itself. One who both defines 'cause of A' as 'that on which A depends', and affirms universal explicability, must therefore, if he is to be consistent, assert everything having a beginning to have a 'cause'.

The picture of the universe as a system the existence of each of whose members is entailed by a condition, or conditions, indispensable to it, was seen to grow in favour with the growth of modern physics. And this was seen to have nurtured the conception of a 'cause' as essentially entailing its effect'. When the term 'cause' is so defined, Hume's maxim asserts everything having a beginning to be entailed; it is in this sense that it has generally been discussed by his successors.

It might be objected that Hume was in no position to discuss the maxim adequately until he had completed his own definition of the term 'cause'. It is true that he could have discussed it with far less danger of confusion after completing that definition. And it is no less true that it would be patently unjustifiable to attempt a demonstration of the maxim's truth before completing one's definition of the term 'cause'. For, clearly, some of the

as yet unrecognised, or at least unspecified, conditions which its completion would involve one in asserting as essential to an existent's constituting a 'cause', might be inconsistent with this conclusion.

It is, however, equally true that Hume has already said sufficient concerning his definition of the term, to allow the possibility of his showing the maxim's truth incapable of certain proof.

He has explicitly affirmed his determination to call only something temporally prior, and contiguous, to an existent its 'cause'. And he has further confirmed that his discussion is concerned with the term solely as used by the scientific rationalist, by maintaining its necessary connection with its 'effect' to be essential to the idea of 'cause' whose source he is seeking.(109) From this is is clear that he could not consistently call A 'cause of B', unless he thought himself to have good reason to suppose phenomena of the former's type to have been constantly correlated with others like the latter.

This is to say that he has, in effect, defined two relations in which everything he is prepared to call 'cause' stands to its 'effect's as well as a further relational characteristic common to everything he is prepared to call 'cause'. To show the impossibility of proving that to everything having a beginning there stands in these relations something with that additional characteristic, is to show that, given Hume's definition of 'cause' (no matter what else as yet unspecified it may include), it is

impossible to prove certainly that whatever has a beginning must have a 'cause'. And it is precisely the impossibility of proving the maxim's truth which Hume endeavours to show in the section under consideration.

Hume does not make it clear whether he is here concerned with the maxim as interpreted by the scientific rationalist, or solely on the basis of what he has already specified of his own definition. This might be a serious omission. For since the disproof of the maxim's demonstrability in terms of the 'regular sequence' definition entails its disproof given the scientific rationalist interpretation, while the disproof of its demonstrability on the latter interpretation does not necessarily involve its disproof on the former; it is often essential to correct evaluation of a philosopher's arguments and conclusions on the subject, to know to which interpretation of the maxim they are meant to refer.

In the present instance the omission is not serious, however, since (as will be seen) (110) Hume's arguments disprove the maxim's demonstrability either on both, or neither, of these interpretations.

His care to reinforce the conclusion of this discussion after completing his definition, by urging (111) the maxim's evident indemonstrability, not only on the basis of his fullest definition, but also given the more limited one in terms of 'regular sequence', might well suggest that he regarded his former discussion as refuting the maxim's demonstrability only on the scientific rationalist interpretation. For him to have so far misunderstood the implication of his own arguments would indeed seem surprising,

and it is possible that he only feared his readers doing so.

Hume's asserting contiguity between 'cause' and 'effect' has been seen to be unjustifiable, (112) and rejected by most philosophers. These, therefore, would deny the maxim as interpreted consistently with his conception of either the scientific rationalist, or regular sequence, definition of 'cause'. Leaving aside this difference, which is of minor importance to the points here at issue, it is evident that neither 'Whatever has a beginning is preceded continuously with something entailing (or contributing to the entailment of) its existence', or 'Whatever has a beginning is preceded continuously by something on which it follows consistently with an universally exemplified rule', can be regarded as a 'general maxim of philosophy' in the sense of a tenet accepted by all philosophers. It is, for instance, rejected, at least implicitly, by all who suppose free volitions may occur.

The first of these assertions (and hence the second, which it includes,) is, however, ordinarily accepted by the scientific rationalist. When he admits the continuity of time, its acceptance is, indeed, intrinsic to the latter's conception of the universe as exhibiting necessary correlations throughout, and containing no member whose existence is not inevitable. It is true that the existence of any one of a number of completely simultaneous things might be entailed by that of the others; but unless that of all but one of these was entailed by something existing previously, it is possible that none of them might have existed at all.

Since, therefore, Hume's discussion of 'causation' is confined to an examination of their use of the term, his attribution of the maxim, to philosophers in general might be regarded as intending to attribute its acceptance, on one of the two above interpretations, to scientific rationalists alone; and thus as true, though misleadingly phrased.

On the other hand, it is possible that, in ascribing the maxim to philosophers in general, Hume was thinking of its widespread acceptance on the minimum interpretation common to plain men, scientific rationalists, Aristotelians, and (probably) others: namely the less restricted contention that whatever has a beginning is dependent for its existence on something external to itself. If this was his intention, he certainly had no right to express it by affirming the general acceptance of the maxim. For it would have been inconsistent with both his explicit assertions and his general usage to have adopted, even at this stage, so wide an interpretation of the term 'cause'.

(B) The aim of Hume's discussion

Before embarking on a detailed examination of Hume's discussion of 'universal causation', it will be well to attack a common misunderstanding. It is widely held that Hume's intention here is to deny the existence of 'universal causation', or at least its necessity. This for instance, seems to have prompted Laird's remark that 'Hume contradicted himself when he said that the impression of necessity was itself caused'. (113) (Though elsewhere (114) he acknowledges that Hume never meant to deny the

maxim). But Hume is explicit in stating his intention to be simply that of showing we have no rational ground for affirming the maxim's certain truth. And clearly to argue, or assert, that something cannot be known to be certainly true is not to maintain it to be certainly false.

Hume, indeed, affirms repeatedly that he is concerned with whether we can know the maxim to be certainly true. At the outset, after saying that its truth is commonly held to be intuitively certain, he maintains that 'if we examine this maxim by the idea of knowledge above explained we shall discover in it no mark of any such intuitive certainty'. (115) And, having argued this point, he then proffers a further argument which, he claims, will prove it to be 'neither intuitively nor demonstratively certain'. (116) Then, having defended his contention directly, to his own satisfaction, he further supports it by criticising current arguments purporting to prove the maxim's certain truth. (117) He closes the section by reiterating his denial that its truth is either intuitively or demonstratively certain, and expressing the hope that this is sufficiently proved by his arguments.(118).

Thus, when, nearly twenty years after publishing the Treatise, Hume denies ever having 'asserted so absurd a proposition as that any thing might arise without a cause', (119) he is not recanting a more revolutionary opinion of his youth.

It could certainly be objected that he cannot justly call the proposition, here repudiated, absurd, without recanting the views expressed in the Treatise. For if it cannot be certainly known

that everything having a beginning must have a 'cause', to postulate that this is not so is clearly not nonsensical, though it may be unreasonable in the sense of asserting something highly improbable. Nevertheless, it must be admitted in Hume's defence, that (as will be seen below) it is intrinsic to the account of 'causation' in the Treatise that we are in fact quite unable to discard the belief in 'universal causation'; and by calling its denial absurd he might well mean to say no more than this, for certainly the denial of an opinion which we cannot discard seems absurd even though we are unable to defend the latter.

Again, it might be objected that although Hume's earlier conclusion leaves open the possibility that 'universal causation' obtains in fact, it excludes that of its obtaining necessarily. This objection rests on confusing a thing necessarily being true with knowing that this is so. In order to show it to be unjustifiable to assert something as necessarily true, one need only prove it to be neither self-evident nor capable of certain proof. But this is inadequate to justify a categorical denial of its necessity. It is possible, for instance, that the necessity of everything with a beginning having also a 'cause' is real, but unknowable to us because dependent on some factor, or factors, to us undiscoverable. To justify its categorical denial a philosopher would have to show it to be either self-contradictory or inconsistent with incontestable evidence.

(5) Critical Analysis of Hume's Discussion.

Hume starts his discussion of the maxim by pointing out that none of the four relations he has asserted to be the sole objects of certain knowledge is postulated in saying that whatever has a beginning must have a 'cause'. He therefore concludes that this cannot be known with intuitive certainty. (120) He might, indeed, have argued that this excludes its being known certainly at all, since he thinks these four relations the sole objects of all certain knowledge.

This argument has obvious disadvantages. In the first place it will convince only those who have already accepted Hume's view of knowledge. Furthermore, although it is possible that one might be able to know the causal maxim to be true, without having certain knowledge of any 'causal connection'; yet a large number of those accepting the axiom hold some 'causal' relations certainly knowable. And this number includes contemporaries of Hume. Hence many of those to whom Hume's defence of his conclusion should have been directed would have been left completely unconvinced by this argument.

Hume was evidently aware of this latter defect. For, after challenging his opponents to produce another possible object of knowledge which might justify their certainty of the axiom's truth, (121) he promptly proffers another defence which, though dependent on an element in his theory of knowledge, would, if acceptable, prove his conclusion correct independently of any other tenet concerning 'causation'.

He begins this second argument by pointing out, truly, that to prove everything having a beginning to have a 'cause' is to show that nothing can come into existence without one. This latter he affirms to be utterly incapable of proof since the ideas of 'cause' and 'effect', being distinct, are separable and therefore the types of impression or object to whichthey correspond are equally so. (122)

This argument clearly rests on Hume's identification of 'image' and 'concept'. Given that to form an image of anything is to conceive or 'understand' it, the possibility of forming an image of something coming into existence without a 'cause' means that this latter is conceivable. It is true that formerly, in discussing the relation of 'image' to 'understanding', Hume has insisted primarily on the impossibility of 'understanding' anything without possessing its image (a contention in which he was seen to be mistaken). Since, however, he constantly uses the term 'idea' as synonymous with both 'concept' and 'image', there seems no doubt that he intended to identify them throughout.

It is certainly true that whatever is imaginable is conceivable. But to treat an image as a concept, without qualification, is, to say the least, misleading. For since, as has been seen, Hume was mistaken in supposing that nothing can be understood without its image being entertained, it is at least possible that there are some things, all the information needed for the comprehension of which can be represented by no image however complex. It might, therefore, be possible to form an image of something coming into

existence without having a 'cause', ~~could be formed~~, but only because such an image inevitably fails to represent a factor intrinsic to coming into existence. Hume's argument is thus insufficient to prove his point. It needs supplementation, or at least confirmation, by information gained from an analysis of the nature of coming into existence which is not confined to the formation of images - that is to say, by understanding what is meant by coming into existence in the ordinary sense of the term 'understand'. Clearly, if one has to appeal to 'understanding' in this sense any way, it is simpler and more convenient to do so in the first place. Moreover, since the formation of images is relevant to the conclusion only insofar as it contributes to 'understanding' in this sense, any additional appeal to their formation is superfluous.

This, of course, is not to say that anything's coming into existence without a 'cause' is inconceivable; it is merely to assert Hume's argument inadequate to disprove this.

Even did Hume's second argument suffice to prove anything's coming into existence 'uncaused' conceivable, it would fail to justify his claim to prove the maxim affirming 'universal causation' to be 'neither intuitively nor demonstratively certain'. (123) By showing its contradictory to be conceivable he would certainly have disproved the maxim's intuitive certainty, but this is all. For, as has been seen,(124) that which is intrinsically conceivable, and so possible, considered in itself, may still be necessarily impossible in virtue of the existence of something precluding

it. Thus, for instance, taken by itself there is no intrinsic contradicition in my being at Hampton Court at 2 p.m. on June 5th 1954; but given that I cannot be in two places at once and that I am in the Louvre at 2 p.m. on June 5th 1954, my being then at Hampton Court is thereby rendered necessarily impossible. As has already been noted in passing (125) and will be discussed more fully below, (126) it was precisely the possibility of this extrinsic type of entailment which formed the basis of Kant's answer to Hume.

Having, to his mind, satisfactorily disproved the maxim's certain truth, Hume reinforces this conclusion by criticising four arguments used currently in defence of its certainty. These, used variously by Hobbes, Clarke, Locke, and others, (127) all agree in begging the question. The first three contending: that whatever has a beginning must have a 'cause' because, otherwise, (a) there would be nothing to determine when and where it should exist, and hence it would not exist at all; (b) it would 'cause' itself and so exist before coming into existence; (c) it would be produced by nothing; while the fourth (in Hume's view the most 'frivolous' of the lot) consists in maintaining that every 'effect' must have a 'cause' because this is implicit in the idea of an 'effect'. Hume has no difficulty in disposing of these arguments, pointing out that (a) if anything's coming into existence 'uncaused' is conceivable there is no absurdity in supposing the time and place of its doing so to be also undetermined; (b) to call A uncaused is to deny its being 'caused' either by itself or by nothing; (c) to define 'effect' as a relative term is not to assert

it applicable either to everything or to everything having a beginning.

It has been seen (128) that Hume's discussion ought to have been, and probably was, intended to concern either the assertion that whatever has a beginning is preceded by something on which it follows necessarily (given certain conditions), the assertion that everything having a beginning has an antecedent which it follows consistently with a law of regular correlation which there is good reason to suppose to have been exemplified in the past;, or else both assertions in turn.

Clearly if we could be shown incapable of knowing certainly that whatever has a beginning is preceded by something which it follows consistently with a rule of regular correlation exemplified in the past, this would disprove any claim to knowing certainly that everything having a beginning has an antecedent which it follows necessarily. If, therefore, Hume had succeeded in his aim of showing it to be conceivable for something to come into existence irrespective of its antecedents, or lack of them, he would have disproved our certain knowledge of the truth of both assertions. It is relevant to ask what would be required to achieve this.

If it could be shown possible, intrinsically and extrinsically, for anything having no antecedent to come into existence, clearly this would show both assertions incapable of certain proof.. Hume could not consistently have defended his thesis on this ground however. For since we suppose the histories of humanity and of

the universe to have extended long before our own lives, and Hume and his contemporaries did so also, (though they made a more modest estimate of that prior history's extent), and event's coming into existence preceded by nothing is to us (and was to them) unimaginable, and thus is, on Hume's view inconceivable. Hume has, however, been seen to have been mistaken in identifying the unimaginable with the inconceivable. It is certainly quite possible to understand what is meant by the assertion that something came into existence nothing having existed before. And the occurrence of such an event can be known to be possible if the existence of something inexplicable can be shown to be so.

If the existence of something inexplicable is not held to be possible, or if it is held to be impossible on other grounds for something without an antecedent to come into existence, then it is impossible to completely exclude the possibility of knowing that whatever has a beginning must have a 'cause' on either the scientific rationalist or regular sequence interpretation of that maxim. For if an existent has an antecedent, then unless both it and its antecedent can be known to be completely simple and independent (which is in practice impossible, and normally would indeed be highly unreasonable) the possibility always remains that though the antecedent consistent with the laws which experience has led us to formulate is lacking, there is some circumstance present, given which, another antecedent (or antecedents) postulated, or discovered, would invariably be followed by that existent.

At the same time, I can discover no certain proof of the truth of Hume's maxim on either the scientific rationalist or regular sequence interpretation. Moreover, the evidence conflicts with its truth when so interpreted, for there are psychological phenomena which we have as yet been unable to show consistent with any law of regular sequence whose postulation is justified by experience. This in itself is not inconsistent with the maxim's truth on either of the above interpretations, nor need it constitute any stumbling block to our certainty of its truth so interpreted, could this be proved demonstratively. But in the absence of demonstrative and intuitive certainty, conflicting inductive evidence excludes its only other effective defence.

Therefore although I cannot regard Hume's arguments as fulfilling their claims to refute the maxim's certainty on either of these interpretations, neither can I accept the view of those claiming to be certain of its truth when so interpreted. I am thus forced to take a less dogmatic stand than either Hume or these of his opponents, in this matter.

It has been seen (129) that though the principle giving conviction to all the interpretations of the maxim - namely that nothing existent is inexplicable - is not itself intuitively or demonstratively certain, its refutation is extremely difficult to maintain with consistency: the principle itself being fundamental to the greater proportion of the contentions of both philosophers and plain men, and its denial psychologically repugnant to us. And hence the denial of the wider interpretation of the maxim, which

Hume was not entitled to adopt, namely the assertion that whatever has a beginning is dependent on something external to itself, is equally difficult to sustain.

(f) Causal Inference.

(A) An Outline of Hume's Discussion.

The answer to the second of Hume's subsidiary questions, namely why we suppose given 'causes' must necessarily have certain specific 'effects', was of fundamental importance to his analysis of the notion of 'cause'.

For this reason he devotes a great deal of space to the former; indeed he devotes to it nearly twice as much as to all the rest of his discussion of 'causation' put together. As remarked above, (130) one reason for the length of his discussion of 'causal inference' is its involving an account of belief; another lying in the close kinship of his view of probability inference to his account of inference from 'cause' to 'effect' properly so-called, which renders discussion of the former inference very relevant to his account of the latter. Nevertheless, as testified by Hume's recapitulation of his argument in the Enquiry, his position may be stated much more briefly than it is in the Treatise.

I shall endeavour, here, simply to outline Hume's discussion with a few brief comments in passing, reserving treatment of anything requiring more than brief remark (e.g. Hume's rejection of the entailment view of 'causation', and his doctrine of

belief) until later.

Hume's account of causal inference rests on three basic contentions, which he introduces in the following order.
1. Every inference from 'cause' to 'effect', properly so-called (i.e. capable of being so described consistently with scientific-rationalist usage), is prompted by a present impression or memory; any inference not so prompted failing to carry the conviction characteristic of 'causal inference'. (Hume refers to memories sometimes as 'impressions', and sometimes as 'ideas'; he allows that they may become so faint as to sink to the level of mere 'ideas', (131) but holds the foreeful memory, that of whose veracity one has no doubt, to have the status of an impression. To avoid confusion, I shall confine the term 'impression' to the present lively experience so described by Hume', using the term 'memory' in the usual way). 2. We can never learn, from considering their respective characters, that the existence of one thing entails that of another. 3. Whenever we properly call one thing 'cause' of another, we have previously experienced several phenomena like the former having observed none which was not followed by one like the latter.

Hume postulates two elements in 'causal inference';
(a) the passage of thought from a present memory or impression to an idea resembling impressions found to have constantly followed those of the type exemplified in the initial memory or impression; (b) belief that the customary correlation holds in the present instance.(132)

Clearly this could not constitute an adequate account of 'causal inference', since it poses, but leaves unanswered, the crucial question: 'Why, when we postulate a 'causal connection', do we believe a customary correlation to be exemplified in a present instance?'. Hume is well aware of this and accordingly proceeds to answer the latter question.

He contends (133) in the first place, in an argument similar in principle to two he has already used, that this belief cannot rest on rationally justifiable certainty since a change in the course of nature is quite conceivable.

He next considers (134) the possibility of the belief's resting on a probability inference. Reason, he argues, cannot even justify our supposing the belief's confirmation probable since every probability inference assumes it. This latter contention he defends by arguing that whenever anyone infers a probable conclusion he argues from the observed to the unobserved and hence must assume universal 'causality'.

To conclude his discussion of the possibility of the belief's dependence on reason, Hume examines an argument which has been urged in defence of its rationality:(135) namely, that if phenomena of a given type A, have always been found to 'cause' those of another given type B, an A must have the power of producing a B, while the possession of this power in its turn entails that every A produces a B. Hume points out that he has already argued both that the terms 'production' and 'causation' are synonymous, and that there is nothing whose existence we can certainly know to

entail a productive power in anything else. But, he says, he will not appeal to these conclusions in order to refute the argument at present under discussion lest he should unnecessarily weaken his position by making one part of it dependent on another where this is avoidable. Therefore he points out that even though 'causation' be allowed to imply the presence in the 'cause' of productive power which in its turn entails its 'effect's' existence, since no such power is discoverable among any object's sensible qualities, its existence can only be inferred from the fact of A's having always been followed by B's in the past. He has but now argued the impossibility of a rational justification for any inference thus assuming the uniformity of nature, and he here reiterates this denial.

If it is incorrect to describe our belief in the uniformity of nature as resting on reason, the most adequate account of 'causal inference' (which pre-supposes this belief) can do no more than offer a description of the latter and of the conditions under which it arises. Hume, therefore, turns his attention to this.

His account of belief throughout presupposes his conviction that comprehension consists solely in the entertainment of images.(136)

He holds (136) that in believing anything (e.g. that A will soon die), and in simply conceiving it, we entertain precisely the same images; the former experience being differentiated from the latter solely in the manner of its impact on the experient.

Hume never succeeds in giving an adequate account of this characteristic mode of impact distinguishing belief. That he was quickly dissatisfied with the account he offered in the Treatise is, indeed, sufficiently attested by a section of the Appendix in which he seeks to qualify and expand this.(137) In both the body of the Treatise and the Appendix, that which distinguishes belief from simple comprehension is described as the manner in which the relevant ideas are conceived.(138) This, by itself, could be taken to mean that the distinction lies in the mind's action upon images rather than their impact on the mind. It is clear, however, from his attempts to amplify this contention in both contexts, that he regarded the latter as the distinguishing factor in belief.

In the body of the Treatise he describes it (139) as a superior force or vivacity, acknowledging afterwards in the Appendix (140) that these terms provide, at best, an inadequate definition. He does not, however, proclaim the inadequacy of his first definition in order to replace it with one more precise, admitting instead (141) the impossibility of doing more than approximate towards this. Here he states simply that nothing can be said of the nature of belief, without qualification, save that to believe anything 'feels different' from merely conceiving it, and that his former use of the terms 'superior force', 'liveliness', etc., is but an attempt to express this difference. It thus appears evident that Laird's assessment (142) of the modification found in the Appendix is right, and that of Whitehead (143) wrong;

for both the original account, and the paragraph modifying it, agree fundamentally in each defining belief as the entertainment of an image plus its having a distinctive manner of striking the experient. And that it was Hume's intention to adhere to this contention is confirmed by its reiteration in the Enquiry. (144)

The account of the origin of belief which follows, reveals Hume's view of its role in 'causal inference'. It further shows the importance, to his doctrine of belief, of his analysis of experience. For he regards the force or peculiar feeling distinguishing the believed idea, as not only similar to, but also as derived from, that which he considers characteristic of an impression.(145) He has already said (146) that the mind generally passes from impression or idea to an idea similar to an impression resembling, contiguous to, or causally connected with, one like the original impression or idea. In defining belief he contends that, in the course of such a transition from an impression or strong memory, some of the vivacity, assurance, or distinctive feeling, proper to the former passes to the associated idea.(147) This view he defends and amplifies: contending, in the first place, that a forceful, or otherwise emphatic, mental disposition or feeling flavours anything experienced concurrently; and secondly that the ease with which the mind passes from an impression or memory to an associated idea prevents the change altering (or altering much) the disposition or special feeling originating in its experience of the impression or memory. (148)

This account of the matter is, he avers, entailed by 'the nature of relation and that facility of transition which is essential to it'. (149) Unfortunately, however, he fails to offer any ground for accepting the contention basic to the effectiveness of this demonstration - namely that facility of transition is integral to r elation, neither attempting to prove it nor declaring it to be intuitively certain (a claim which would not have been justified anyway). But even had he vindicated his demonstration he would not have been entitled to appeal to it, since the categorical denial that we can know any phenomenon to entail another is fundamental to the position he is maintaining.

Perhaps because he recognises the weakness of his appeal to demonstration in the matter, Hume hastens to add (150) that he places his 'confidence in experience to prove so material a principle', and cites examples (151) in support of his theory. His choice of instances for this purpose is rather surprising. It includes an absent friend's being brought vividly to mind at sight of his portrait, the stimulation of devotion by religious ceremonies, ideas connected with a place being enlivened by its proximity, and stimulation of devotion at sight of objects used by a saint. None of these would ordinarily be described as an instance of the birth or increase of belief. Thus an absent friend's portrait would be said to bring him to mind, but not normally to provoke or strengthen any belief concerning him. We believe, for instance, in his existence whether we see his

picture or not. Sight of the portrait would certainly provoke the belief that an artist had existed and painted it, but so would that of any other picture; and in Hume's view such a belief would consist in a vivid image of an artist painting the picture in question, not in one of its original. A saint's relics, in stimulating devotion, give rise to no new belief concerning him, and so on. Indeed, these examples serve to show the inconsistency of Hume's definition of 'belief' with customary usage; for if 'belief' is defined as in some way a strengthening or reinforcing of an idea or its impact, then assuredly the foregoing must be accepted as examples of it. And yet Hume gives no explicit indication that his use of the term differs from that customary, nor indeed does he appear to suppose this.

Having admitted resemblance and contiguity, as well as causality, as initiating belief, Hume lays himself open to the objection that he has refuted his view of 'causal connection' as our sole source of belief in unobserved matters of fact.

In order to counter this objection he first reaffirms (152) that memories as well as impressions together with everything known to be 'causally connected' with either (whether immediately or through the intermediacy of other 'causes' and 'effects'), when conceived, strike the mind with the assurance of reality. It is, he contends (153) only resemblance and contiguity between these 'realities' which leads to the associative process initiating belief. In other words, he explains that in his view 'causal inference' - belief in a given relevant 'causal

connection' - always precedes an associative process, or belief, resting on resemblance or contiguity; and hence 'causal connection' is the sine qua non of belief in unobserved matters of fact.

He then proceeds to explain the superior force or assurance accompanying 'causal inference' by affirming that while the mind's passage from an impression to the idea of its 'effect' (or from the memory or idea of the former to the latter) is involuntary and invariable, resemblance and contiguity alone do not ensure such passage, but merely facilitate it while leaving it subject to voluntary control. (154) He does not further amplify this explanation (probably he thinks it unnecessary); but clearly its force rests on his previous account of the transfer of vivacity or assurance from impression or memory to associated idea. Consistently with this account, the lack of spontaneity and invariability in association resting on resemblance or contiguity renders mental transition resting on either of these less easy than the spontaneous passage from 'cause' to 'effect'; the lack of ease in transitions of the former type considerably dissipating the assurance or vivacity attaching to the initial impression or memory, whereas the ease of the transition from 'cause' to 'effect' preserves it.

Having argued thus, Hume maintains that, so far from constituting an objection to his theory, the role of resemblance and contiguity in prompting and fortifying belief, serves to support it by confirming the basic contention that 'belief is nothing but a lively idea related to a present impression'. (155)

He follows up this remark by producing yet further examples of the role of resemblance and contiguity in initiating and stimulating belief, in order to support this basic contention. (156). This procedure is rather surprising. Certainly, in the absence of any instance of belief which could not be described simply as a 'lively idea related to a present impression', every belief which could be so described would be additional evidence in favour of this basic contention of Hume's. But two or three additional examples cannot add much weight to it by sheer force of numbers, as he evidently supposes. Indeed, unless good ground is offered for holding there are no instances of belief which do not conform to his definition, citing examples which do, cannot justify his regarding that definition's adequacy as even sufficiently probable to justify its adoption: and Hume offers no such ground. He does, indeed, maintain that only those ideas resembling impressions can be entertained with the vivacity of belief, offering one example in defence of this contention.(157) But even if this is true (which Hume can hardly be said to have shown) it does not prove his point; for it might well be true that every belief consisted in the entertainment of an idea resembling an impression, without its also being true that no belief consists in anything more than a firm (or otherwise strikingly experienced) idea related to an impression, let alone that all belief originates as Hume supposes. His view of resemblance as essential to belief is, indeed, very surprising; for either it is nothing but a reiteration of one of his earliest

statements, or else it is false. For, as has been seen, (158) the contention that there are no ideas which do not resemble impressions (or their elements) at least in their constituent parts is fundamental to his position. If, therefore, he is saying anything fresh in asserting resemblance essential to belief, he must be contending that every belief consists in the entertainment of an idea which, if complex, resembles a complex impression: and this is clearly untrue. If it were not, then no one who had not seen Paris could believe in its existence.

Hume's postulation of resemblance and 'causation' as bases of association (and therefore, of belief) seems unjustifiable to Kemp Smith.

Writing of resemblance, the latter objects that while that bringing an idea to mind often resembles it 'Hume ..... does not give any reason for holding that it is owing to this resemblance' that whatever thus brings an idea has 'this power of recall'. (159) And, indeed, he urges, since impressions or ideas resembling the two terms of such an association may never have been experienced together in the past, the comparison revealing the resemblance may not occur before the association, which is supposed to rest on it. (160) This objection is itself clearly open to criticism. For it assumes Hume to be unjustified in asserting resemblance to initiate association unless he can also show that the former entails, and is capable of being known to entail, the latter so the correlation of the one with the other may be seen to be 'reasonable' in the classical sense. This assumption is clearly

unjustified since it is the essence of Hume's position that association is not a 'rational' process in this sense, and cannot be rationally justified or explained; it would be inconsistent in him to say more on the subject than that there is reason to suppose certain conditions, or one or another of them, to have occurred whenever association has taken place. Indeed, it has often been objected that Hume, inconsistently, neglected to remain within these limits.

Aginst Hume's postulating 'causation' as a distinct basis of association, Kemp Smith argues (161) that if, as Hume says, contiguity is an associative relation then, since in his view a 'cause' is always contiguous to its 'effect', he need postulate nothing beyond this contiguity as a basis of our associating 'cause' with 'effect'. This objection overlooks Hume's insistence that 'causation' is not simply one among the bases of similar associative processes, but is instead the basis of one distinguished by its invariability and spontaneity, causal connection being unique among other associative relations in its constancy.

It might, perhaps, also be objected that, having introduced his account of mental association in order to help explain 'causal' inference, Hume promptly begs the question by postulating 'causal' connection as an associative relation. This objection, however, is no more justified than are the former. For it seems clear that Hume intends to account for 'causal' inference by showing it to be an associative process similar in principle

to others, its distinctive features betokening a difference only in the conditions under which those principles are exemplified. The most that can be urged in Hume's criticism in this matter is that he is not sufficiently explicit to avoid the possibility of this misunderstanding.

Hume concludes his account of the origins of belief by remarking (162) that the mere repetition of an idea, as in education, may initiate belief in it; an idea constantly repeated coming to mind easily and with a certain force. But, he says, as beliefs so induced often ~~both~~ contradict one another and 'are frequently contrary to reason' (163) (by which, presumably, he means that they contradict beliefs resting on 'causal connection' since, inconsistently, he ordinarily distinguishes these latter beliefs from others as 'reasonable' from 'unreasonable'), they are disregarded by philosophers.

To complete his treatment of 'belief', Hume devotes a few pages (164) to its influence on behaviour, the passions, and the imagination. They may be summarised as follows. Impressions and ideas move us to appropriate action insofar as they appear either pleasant or painful to us; and it is only impressions and those ideas having the force of reality (i.e. 'the ideas of those objects which which we believe either are or will be existent') (165) which do so. And similarly it is only impressions and forceful ideas which stimulate passion. Here, however, there may be a reciprocal transfer of force; namely its passage first from the believed idea to the passion this stimulates, and thence back to

that idea thus finally reinforcing the original belief. (Hume is here thinking of such phenomena as the fearful person's greater readiness than others to believe in the presence or prospect of danger). And the same principle is exemplified in our attitude to the imaginary; we accept and enjoy a fiction only if its elements resemble realities in having some of the latter's force and conviction. Madness can also be described in terms of this conception of belief, being an abnormal state in which the force of reality attaches to ideas haphazard whether or no there is any 'causal connection' between impressions corresponding to those ideas and known realities.

This section is relevant to Hume's account of 'causation' in two respects. 1. It is an attempt to reinforce it by trying to show the conception of belief underlying it to be consistent with phenomena additional to those already examined. 2. It introduces the notion of transfer from feeling to idea which, in a slightly different form, is fundamental to Hume's account of 'causation'.

Having completed his account of belief Hume turns to an examination of those inferences which do not provoke complete assurance, in order to show all matter of fact inference to exhibit the same basic principles as that from 'cause' to 'effect'.

It is his desire to examine 'probability inference', in this sense, which forces Hume to admit (166) the inadequacy, on his analysis, of the traditional twofold distinction between knowledge and probability.

'Probability' as opposed to 'causal' inference in failing to carry complete conviction, Hume thinks of two main types which he describes respectively as 'that which is founded on chance, and that which arises from causes'; (167) but he also discusses what he calls 'unphilosophical probability' + (168)— namely conditions affecting confidence in a conclusion though philosophers regard their doing so unjustifiable.

Under the heading 'Of the Probability of Chances' Hume discusses (169) such inference as estimating the likelihood of a dice falling with a given number uppermost. Under the title 'Of the Probability of Causes' he examines (170) inference leading to some, though incomplete, confidence in the existence of a 'causal' connection between phenomena. In distinguishing these two types of inference Hume showed more insight than some of his successors.

Hume's theory of the 'probability of chances' rests on the assumption of equiprobable chances. (Hume, in effect, denies the existence of chance in any sense but that in which it rests on a limitation of knowledge). (171). When, as we say, we are estimating the relative likelihood of chances, we have already found any one of a number of alternative events occurring under given circumstances. Because of this, the mind passes from the impression, memory, or idea of those circumstances, not to a single idea as in causal inference, but to the idea of each alternative in turn; any force attending the original idea or impression being thus divided between them. This is to say

that we have no more confidence in the occurrence of any one of these alternatives rather than another. If, therefore, they all differ in type, each, as it were, cancels out the influence of the other. If however, two or more such alternatives are similar, our confidence in the occurrence of an event like them is relative to their number. And thus it is that we have most confidence in, or regard as most probable, the occurrence of an event of the type exemplified in the greatest number of such alternatives. This is why, for instance, we think that with a dice four of whose six sides show six pips, two of them showing four, anyone would be more likely to throw six than four.

Hume distinguishes 'probabilities of causes' into three kinds which, he says, arise respectively from 'an imperfect experience', 'contrary causes', and 'analogy'.

The first type occurs when phenomena of a given kind, have been found to be followed constantly by those of another, but not many instances have been observed, and we lack the complete assurance in their future conjunction which we should have if we regarded their connection as 'causal'. No adult experiences this type of inference. For, by the time we reach maturity we have become convinced of so many 'causal connections' that we suppose every phenomenon 'causally connected' with some others; and hence, in the absence of contrary evidence, any experienced constancy of types suffices to evoke in us that assurance in its invariability distinguishing a belief that a connection is 'causal'. (172).

The probability arising from 'contrary causes' resembles 'the probability of chances' insofar as it rests on our having observed different types of event occurring under apparently similar conditions, any force or assurance deriving from those conditions, or an idea or memory of them, being thus divided between these alternatives. This inference differs from that concerning 'the probability of chances', however; for in the latter our confidence in the occurrence of a given type of event derives from, and corresponds to, the number of the possible alternatives in which it is exemplified; whereas in the former such confidence increases with the repetition of events of a given type under the appropriate circumstances.(173) It might perhaps be argued that what Hume calls 'the probability of chances' of an event's occurrence either is, or equals, its frequency, and that therefore he is mistaken in postulating probability resting on 'contrary causes' as a type of inference distinct from this. Neither the equality of 'probability of chances' and frequency, however, nor their identity, could justly be regarded as a ground for rejecting Hume's distinction in this matter. For, as is generally recognised by both exponents and opponents of the frequency theory of probability, any frequency may occur in a finite series. And the basis of Hume's probability inference from 'contrary causes' is simply the frequency of a given type of event within a finite experience. Certainly it is true that Hume fails to give a rational account of probability inference in failing to explain why our division

of confidence between possible alternatives is relative sometimes to the distribution of types among them and sometimes to the frequency of given types in our experience of them. Indeed, not only does Hume fail to give a rational explanation of this, but his account excludes its possibility. This is sufficient to refute it, if this difference must have a rational explanation. But since, as has been said repeatedly, Hume's account of both 'causal' and 'probable' inference in general rests on a denial of its rationality, he would have been inconsistent had he offered a rational explanation of that difference; while no one who rejected his account of probability because of the lack of such explanation could consistently accept any part of Hume's theory of inference. Nevertheless it may justly be objected that Hume fails to give an adequate account of probability inference in failing to remark that when we infer 'the probability of chances' we in fact assume ourselves to know conditions determining the likelihood of the events considered, whereas in inferring from 'contrary causes' we make no such assumption. For this is a subjective condition regularly correlated with the difference Hume recognises, whether or not that difference is dependent on it. It should perhaps be remarked in conclusion that, as in discussing 'the probability of chances', Hume insists that the lack of uniformity experienced is due to failure to observe some difference in the correlated conditions which is regularly correlated with the difference in their 'effects'.

Hume's last type of inference from 'the probability of causes', consists in the passage of thought to an idea in which partial confidence is reposed, there being only partial resemblance between the instances whence the inference derives and that to which it is applied. Here confidence is relative to the extent of this resemblance. Hume is thinking of inference such as concluding lobster to be probably indigestible because it is a creature somewhat like a crab which latter has been found so.(174).

Hume discusses three basic types of 'unphilosophical probability': namely, the mind's passage to an idea accepted with partial confidence relative to the temporal proximity of the impression or memory provoking this, passage to an idea accepted with partial confidence relative to the length of the reasoning with which it is reached, and passage to an idea accepted with donfidence resting on generalisation based on too limited an experience. (Hume actually enumerates four types since he distinguishes that correlated with the distance of a simple memory from that correlated with the memory of an experiment, but as both exemplify the same basic principle this distinction is superfluous).

Having discussed belief and probability inference, Hume at last feels himself in a position to complete his account of 'causation'.. Before doing so, however, he briefly recapitulates (175) the conclusions he has already reached on the subject - a necessary precaution after his long digression. This may be

summarised as follows. (1) The notion of necessary connection integral to the idea of 'causation' must derive from an impression. (2) Examination of single instances of 'causal' connection reveals only two common characteristics, namely the relations of contiguity and succession. (3) Repetition of instances of any given 'cause' or 'effect' reveals the relations of succession and contiguity between them to be constant: (4) mere constancy through repeated instances can reveal nothing in any individual not discoverable from its examination alone.

Having recapitulated these previous findings, Hume continues from this point. Closer examination, he says, reveals that after frequent repetition of a conjunction (in the absence of evidence that one of its terms has ever existed without the other), a new impression arises, namely a feeling of being determined or necessitated to pass from one of the connected impressions, its memory or idea, to the idea of the other. It is from this new impression that the idea of necessary connection derives.(176)

Hume offers to justify neither of these contentions. It is true that, subsequently, he defends them indirectly in endeavouring to counter objections; but though he criticises other views of 'causation', he never directly defends his own account of the source of the idea of necessary connection. Presumably he supposed such defence unnecessary: regarding the origin of the impression of being determined as discoverable by any looking for it properly, and supposing that impression's being the source of the idea of necessary connection, to be evident to

anyone comparing them.

However, although regarding his account of the origin of the idea of necessary connection as needing no direct justification other than the injunction 'Look for yourself', Hume is not content with merely stating it. For he wishes both to emphasise its revolutionary nature, and to defend it against possible objections. He therefore first reminds the reader that he has been discussing 'one of the most sublime questions in philosophy viz: that concerning the power and efficacy of causes', (177) and then proceeds to criticise opposing theories.

He begins this criticism by insisting (178) that the terms efficacy, agency, power, force, energy, and productive quality, are all synonymous, and hence the definition of one of them in terms of any other, or others, is tautologous. It will be remembered that he has already said this of the two terms 'causation' and 'production'.

Hume now turns to what he describes as 'the most general and most popular explication of the matter'. (179) According to this account we obtain the idea of causal power by experiencing new phenomena coming into existence and inferring that some power must produce them. To refute this, Hume appeals to two conclusions which he has previously defended, namely: (a) that no idea can arise from reason alone; and (b) that reason alone can never make us suppose that every beginning of existence has a 'cause'. Unfortunately this argument, stated thus baldly, can have little persuasive power in its present context. For

clearly anyone who, understanding what he is saying, at this stage of Hume's enquiry still maintains the view this argument is countering, must have been left unconvinced by the earlier defence of its premises. Nevertheless, Hume's pointing out that these earlier arguments, if accepted, provide a refutation of the view in question, is certainly in the interest of clarity.

Having re-emphasised that the idea of 'causal efficacy' must derive from an impression, Hume next briefly reconsiders the possibility of finding this impression among the qualities of 'causes'. This time he approaches the question differently recalling first those theories attributing 'causal power' to forms, accidents, qualities or virtues. He argues that since none of these latter are observable, the numberous appeals to them to explain 'causation' but attest the impossibility of discovering 'causal efficacy' among observable qualities. This then provides additional confirmation of his contention that the required impression is not to be found among the qualities of 'causes'. (180) (It has been seen that Aristotle calls observable qualities-such as roundness-'forms', that Hume's account of thought is mistaken, and that the notion of 'causal entailment' may be derived indirectly from some qualities of objects in conjunction with the assumption of certain uniformities in nature. But Hume, of course, denies the possibility of the latter, while by 'forms' he evidently means characters presupposing the occult powers of the later Scholastics, or the Baconian forms whose 'causal' efficacy is

equally unobservable).

From the later Scholastics, Hume turns to the Occasionalists. These, holding both that we can fully comprehend the nature of matter and that this latter is essentially passive, ascribe all agency to God. For Hume, however, this is no solution. For, as he holds every idea, at least in its elements, to have some counterpart among impressions, he thinks there can be nothing in any idea of God to which something in an impression does not correspond. Hence, he contends, the idea of God as agent itself presupposes the existence of an impression of agency.(181).

In yet further support of his view, Hume appeals to this theory of abstract ideas. He argues that since he has shown every abstract idea to be simply an individual one 'taken in a certain light', (182) we can form no abstract idea of which a particular instance cannot be conceived, (i.e. on his view, imaged); and we can conceive no particular instance of causal power. And, indeed, it should perhaps be remarked that even though Hume's account of abstract ideas be rejected, no one could be truly said to possess a general idea whose particular exemplification he was completely unable to conceive in the broadest sense of of 'understand'.

After framing these arguments Hume feels in a much stronger position in affirming the required impression to be the feeling of being determined to pass in thought from A to B arising after repeated experience of their constant succession.

He is painfully aware that nothing will seem more paradoxical to his readers than his contending necessity or 'causal efficacy' to be found only in the mind. He therefore seeks to overcome this natural prejudice.

First he points out that our inclination to ascribe necessity or agency to the 'causes' themselves is by no means inconsistent with his theory. On his view this tendency merely exemplifies a common psychological phenomenon, namely the association of an impression and that with which it is normally found to coexist. Thus he is in effect aligning the ordinary ascription of agency to 'causes', with our habitual ascription of scents to objects which they constantly accompany in experience. (183)

And, in further vindication of his paradox, Hume contends those who regard his view as absurd to be in no better position than a blind man holding it ridiculous to deny any difference between scarlet and the sound of a trumpet. For, he argues, since we have no idea of agency as exhibited in 'causes', we are in no position to postulate it, let alone affirm the impossibility of denying it. He admits that there might be unknown qualities of 'causes', one of which might be called 'power' or 'efficacy'; but points out that our supposing this to be so cannot alter the position. He contends, however, that we simply involve ourselves in confusion when, as usually happens, we ascribe the idea of a subjective experience to external objects. (184)

He concludes by pointing out (185) that the process of 'causal inference' which he has described may itself be referred to in terms of 'cause' and 'effect', the original impression being called 'cause' of the associated idea which it brings to mind. His noting this amounts to a positive denial of the inconsistency which later writers have seen in his giving what is, in effect, a 'causal' account of the idea of 'causation'. And, indeed, there seems no reason to regard him as inconsistent in this. For he is saying simply: (a) when we postulate a 'causal connection' we are never justified in affirming more than that two phenomena form a sequence consistently with a rule exemplified throughout past experience; and (b) our attributing necessary connection to such phenomena is itself the latter term of such a sequence. Clearly there is no contradiction here. On the other hand it must be admitted that Hume does not always seem to be aware that he ought to be saying this and no more. Possibly however, his using the language of the activity view has led his readers to do him less than justice on this score.

Hume completes his discussion by first (186) framing two definitions of 'cause' consistent with its findings, and then (187) enumerating four corollaries of these.

A 'cause' he says may be defined either as 'an object precedent and contiguous to another, and where all the objects resembling the former are plac'd in like relations of precedence to those objects, that resemble the latter'; or as

'an object precedent and contiguous to another, and so united with it, that the idea of the one determines the mind to form the idea of the other, and the impression of the one to form a more lively idea of the other'. The charge of circularity may be brought against the second of these definitions; for this latter is at least verbally tautologous given the ordinary usage of the term 'determine'. But this is but another expression of the source of objection just discussed, so that it is hardly necessary to repeat that here Hume may well be blameworthy for no more than an unfortunate mode of saying something in itself unobjectionable.

The first of Hume's four corollaries is that his view excludes any basis for a distinction between 'efficient' and other 'causes', since our only evidence of 'efficiency' is constant conjunction in the absence of which we have no ground for asserting 'causal' connection.(188) Here Hume is indubitably guilty of circularity since it is clear, from the outset, that it is 'efficient causality' alone which he is discussing.

His second corollary is the denial of a distinction between physical and moral necessity since his account allows for only one type of necessity in which there can be no degrees. And, he adds, it also excludes the distinction between power and its exercise.(189).

Thirdly, he maintains his denial of any rational basis of the supposition that whatever has a beginning has a 'cause', to be an evident corollary of either of his definitions.(190)

Finally, he notes that his view excludes the possibility of our believing in the existence of anything of which we can form no idea. For, he points out, all our beliefs in existence rise from 'causal inference' in which we entertain an idea of that whose existence is inferred. (191) Clearly unless, using 'idea' in his accustomed way as synonymous with image, Hume allows the existence or a type of comprehension which does not use images, his fourth corollary is self-evident. Thus, unless he is abandoning a principle basic to his whole discussion, Hume's deducing this, as the corollary of anything else, is superfluous.

iv. Comparison of the Arguments in the Treatise and Enquiries.

Until Kemp Smith's condemnation of the habit (192) it was customary to disparage Hume's Enquiries. Indeed some philosophers still do so. Thus Russell, in his History of Western Philosophy (published five years after Kemp Smith's major study of Hume), writes that in the Enquiry into Human Understanding Hume left out 'the best parts' of the Treatise 'and most of the reasons for his conclusions'. (193) Kemp Smith's more favourable view is, I think, the juster, particularly with regard to the discussion of 'causation'.

Certainly Hume omits the discussion of the belief in 'universal causation' regarded by many as one of the most important sections of the Treatise, which is, indeed inevitably of great interest. It has been seen, (194) however, that even in the Treatise this discussion is meant to be subsidiary to the main consideration of 'causation'. Indeed, it has further been seen that it was not only inessential to Hume's purpose there, but would most conveniently and appropriately have been discussed after that purpose had been fulfilled. (195) Its omission from the main discussion of 'causation' in the Enquiry, therefore, so far from constituting a retreat from the position maintained in the Treatise, witnesses to the Enquiry's greater consistency with, and preciser estimate of, that position.

While admitting this, it might still be urged, however, that belief in 'universal causation' (on any interpretation) is so

evidently important that failure to discuss the possibility of its justification altogether is inexcusable, particularly in one who has already recognised its significance. This, I think, would be mistaken. For from Hume's own point of view the possibility of the maxim's justification is both practically unimportant, and theoretically irrelevant. It is practically unimportant to him because he supposes that every one believes the maxim, and therefore behaviour resting on its assumption will occur whether or not this is ~~justiable~~ justifiable. And it is, to him, irrelevant since he regards belief in the maxim as an automatic non-rational factor like feeling hungry. It is possible to seek and discover circumstances given which the sensation of hunger normally occurs; it is equally reasonable to ask whether that sensation's occurrence under these conditions is of practical value: but it would be clearly ridiculous to ask whether my feeling hungry at any given time was rationally justifiable: and, on the view made explicit in the Treatise (and implicit in the Enquiry), so it is with belief in 'universal causation'.

Nor was Hume's discussion of this belief demanded by its place in contemporary controversy, save insofar as (on Hume's interpretation of the maxim in terms of universal laws) it conflicts with the doctrine of free-will. And this aspect of the matter he does discuss in the Enquiry, at some length.(196).

There is one important difference between the discussions of 'causation' occurring in the Treatise and Enquiry. It has been seen that although the Treatise offers an account of 'causation'

most conveniently described in tersm of relations between events, Hume there habitually refers to 'causes' and 'effects' as 'objects' or impressions, ordinarily applying the terms where the title 'physical object' would generally be thought applicable, none of the examples of 'causes' or 'effects' he offers being events. By the time he wrote the Enquiries, however, Hume had evidently begun to realise the implications of his teaching in this respect, since although he sometimes still speaks of objects as 'causes' and 'effects' and even refers to a 'cause' as an 'object' in his formal definitions of the term, yet both in his opening discussion of 'causation', (197) and his final examination of 'necessary connection', (198) he refers explicitly and quite naturally to events as 'causes' and 'effects'. Moreover, some of the examples of 'causes' and 'effects' offers in the Enquiry (eg. volitions and bodily movements) are unambiguously events.

There are no other important differences between the discussions of 'causation' in the Treatise and Enquiry; indeed most of the differences between them may be summarised as the greater compactness, and orderliness of that in the latter.

It may, perhaps, be well to summarise the minor differences between them.

(a) In the Enquiry Hume does not introduce the denial that 'causal' connection may be known with certainty, until he is prepared to defend it.(199).

(b)The defence of this denial in the Enquiry is far fuller than that in the Treatise. While not differing from the latter

in principle, it shows more awareness that the denial is likely to be questioned, and is better calculated to prompt Hume's unthinking opponent to examine his own position more carefully. One of the most useful parts of this defence, I think, is Hume's pointing out (200) that physical 'effects' may be deduced mathematically, only when the existence of certain uniformities is already assumed. Some modern readers may think this too obvious to be reasonably doubted; but the utility of Hume's emphasising it, is apparent when one remembers that the possibility of verifying such deduction had not only made 'the entailment view of causation' acceptable to many philosophers and scientists, but had actually led many to overlook precisely that obvious truth which he is pointing out. Even today it has been maintained that physics can attain the status of a geometry from whose axioms alone knowledge concerning the physical universe may be deduced. (201) Indeed Mace's contribution to the Aristotelian Society's symposium on mechanical and teleological causation (202) reveals that even a distinguished philosopher, familiar with modern critical discussions of 'causation', can mistake the evident necessity of certain 'causal' connection given the assumption of specific uniformities, for the evident necessity of those connections without qualification. Since the mistake can be made so easily today, there can be little doubt of the need for Hume's warning against it two centuries ago, before the subject had been given the critical scrutiny it has since received.

(c) There are two serious omissions in the account of 'causation'

given in the Enquiry. (i) No reference is made in the body of the discussion to the priority of 'cause' to 'effect', although the final definition of 'cause' offered is in terms of this succession. The omission of the fallacious argument in favour of this contention, however, is an evident improvement.
(ii) there is no mention of the view, maintained in the Treatise, that 'cause' and 'effect' are contiguous. This is more serious as the omission is not rectified in the final definition so that Hume's maturer views on the subject are left uncertain.

(d) In discussing 'causal' inference Hume is again more aware of the need of convincing his readers in the Enquiry. He adds two arguments to those offered in the Treatise. (i) If 'causal' inference rested on reason it could derive from one instance of 'causal' connection alone, whereas it only arises after the conjunction has been repeated.(203) (This ignores the conviction which may arise from a single crucial experiment).
(ii) (A much more effective argument) as infants and animals are capable of 'causal' inference this could rest only on the simplest reasoning which would be readily discoverable, whereas in fact no such reasoning is easily discoverable.(204) (A form of this argument, referring to animals alone, appears in the Treatise after the main discussion of 'causation' (205).
(e) The positive account of 'causal' inference which follows is much briefer than its counterpart in the Treatise. Its order differs for the worse from that of the latter, since the Enquiry does not mention until the end that 'causal' inference originates

from a present impression or memory, and then it comes as an afterthought. (206)

(f) The greater clarity of the Enquiry's account of the stimulative roles of resemblance and contiguity, in relation to that of 'causality', excludes the suggestion that all equally stimulate belief, and thus avoids the need of answering this objection. The additional account of the stimulative effects of resemblance and contiguity, and consideration of the influence of belief, are also completely omitted, the remainder of the discussion of belief being much shortened.

(g) Discussion of causal inference in the Enquiry concludes with arguments of a type not found in the Treatise - arguments appealing to the notions of 'final causation' and 'the ordinary wisdom of nature'. (207) These are regarded by its critics as evidence of the essential dishonesty of the Enquiry; but this, I think, is unjustified. The Enquiry leaves no ground for doubting the inacceptability of these arguments to Hume himself. It seems wholly unreasonable to expect a philosopher, all of whose views were scandalous to his contemporaries, to refrain from defending any of them on grounds acceptable to those contemporaries but not to himself.

(h) The Enquiry's treatment of the 'Probability of chances' differs from that in the Treatise, only in its greater brevity. In discussing the 'probability of causes', (208) however, Hume confines himself to inferences described in the Treatise as rising from contrary causes - a readily justifiable restriction.

Discussion of 'unphilosophical probability' is omitted completely - also with justice, since this is not normally described as probability inference at all.

(i) In the Enquiry Hume is able to avoid recapitulating earlier conclusions concerning necessary connection, because he omits all mention of it until prepared for its final discussion. His earlier discussions have merely denied the possibility of reason either telling us two existents are 'causally' connected, or justifying our inferring from the observed to the unobserved, without indicating anything beyond a rule of constant conjunction to be involved in 'causal' connection.

(j) Again Hume shows himself more aware of the need to convince his readers, systematically examining the various suggested sources of the idea of necessary connections (i.e. physical 'causes' and 'effects', and the experiences of voluntary movement and thought control), arguing forcefully that in each instance we lack the insight requisite for knowing a necessary connection to obtain. Thus, for instance, he points out that we can learn the immediate 'effects' of a volition to move a limb, only from a study of anatomy, (209) and can learn only from experience the extent of voluntary control. (210). These arguments had been used by Occasionalists, (211) who yet maintained it rationally justifiable to assert 'causal' connection between divine volition and physical 'effects'. So, as in the Treatise, Hume turns next to criticising their position, repeating the argument used in the Treatise and adding (evidently from purely

polemical motives). Two others.(212).

(k) The Enquiry omits all direct discussion of what the Treatise describes as 'the most general and popular explication' of the origin of the idea of necessary connection' - namely that having experienced change we conclude that there must somewhere be a power capable of producing it. But since the opening remarks of this section of the Enquiry (213) in effect exclude the legitimacy of this account, its separate discussion would have been superfluous.

(l) Hume now feels in a position to offer his own account of the origin of the idea of necessary connection, which, in contradistinction to his policy in the Treatise, he introduces at this point for the first time. He defends his conclusion by stating it to be irresistible once the opposing hypotheses have been refuted, adding that it is even free from the attacks of sceptical doubt since it asserts merely a limitation of the scope of reasoning and the irrationality of most of our actions and conclusions. (214)

(m) As in the Treatise, Hume concludes his exposition of his position by offering two definitions of 'cause' consistent with it.(215) As has been remarked,(216) they differ from those in the Treatise by omitting any reference to contiguity. Further the definition referring to the psychological factors involved omits the objectionable 'determining'. Certainly it uses the term 'convey' in a context in which it could be taken to denote 'causality'; but, as with the term 'determine' in the earlier

definition, such interpretation is unnecessary.

(n) The Enquiry's discussion of 'necessary connection ends with a brief recapitulation, (217) the superfluous corollaries of the Treatise being omitted.

v. General Criticism of Hume's Treatment of Causality.

I am not offering here a complete assessment of Hume's view of 'causation', since I am deferring discussion of the relative claims of the 'entailment' and 'regularity' views until I consider contemporary discussions. Here I shall confine myself to asking whether Hume's account of 'causation can be regarded as adequate if his rejection of the entailment view is accepted.

It is clear that the answer to this is 'no', for the simple reason that Hume completely ignores the complexity of the 'causal laws' postulated by both science and commonsense. It has been seen (218) that when the scientist or the plain man affirms a 'causal law', he has no intention of asserting unconditional constant conjunction between types of actual experience. When, for instance, he asserts a 'causal connection' between taking arsenic and dying, he does not mean to affirm that whoever sees a person taking arsenic (without seeing him shortly take an emetic) will see him die. And, indeed, it will be generally agreed that this conjunction very rarely occurs in one person's experience. Moreover, both scientist and plain man suppose that some of the 'causal connections' they assert occur whether either of the connected terms is observed or not. They suppose, for instance, that in affirming constant correlation between air-pressure and the position of mercury in a barometer, they are postulating a conjunction which occurs whether or not anyone is observing barometers, or measuring airpressure in their vicinity in any other way. Nor, indeed are there any two types of experience of which a constant conjunction can be asserted unconditionally.

For, as has been pointed out by more than one of Hume's critics (219) it is always possible that anyone may fall asleep, faint, or die, before an experience's customary successor has had time to occur; and no universal unconditional correlation is discoverable between actual experiences attributable to different persons.

Clearly then, if any law exemplified in experience asserts a constant and unconditional conjunction between impressions regarded as sense data, unsensed sense data must exist. 'Causal laws', however, are so interpreted neither by the plain man nor by most scientists and philosophers. There is, therefore, no need to treat them thus unless one is committed to doing so by one's own premises or conclusions.

From the foregoing paragraphs it is evident that no simple account of 'causal laws' is possible, whether one regard them as asserting conjunctions between objective events independent of experience or solely as statements about possible experiences. If one adopts the first of these interpretations one must defend one's postulation of objective events, showing that in doing so one is asserting something other than possibilities of experience', and what this means. And if one adopts the phenomenalist position, one is committed to regarding 'causal laws' as extremly complex, and must therefore give an account of their intricacy.

Hume, however, completely overlooked these problems. And this is the more serious since he offers what is, in effect, a phenomenalist account of experience, and is thus committed to

the postulation of highly complex 'causal laws'.

His critics have, indeed, usually assumed that Hume has made the serious mistake of postulating unconditional constant conjunction between actual experiences.

This is suggested by his speaking of impressions as 'causes' and 'effects', and more especially by his account of 'causal inference' which asserts the belief in 'causal connection' to rise from the experienced constant conjunction of impressions. There is, I think, no need to suppose Hume guilty of this obvious mistake. For he ordinarily treats the terms 'impression' and 'object' as synonymous, while using 'object' where the term 'physical object' would ordinarily be thought applicable. It therefore seems quite probable that, in speaking of impressions as 'causes', he was intending to refer to the complex hypothetical assertions affirmed in the postulation of physical object; while in speaking of experienced constant conjunction of impressions he probably meant, by the latter, experiences of 'material objects' insofar as these must be understood in terms of the truth of such hypotheses. Further, as has been seen, though he more often than not refers to 'causes' as objects, not only is his account of 'causation' most readily applicable to relations between events, but in the Enquiry he sometimes writes as though he is fully aware of this. It seems therefore that when Hume writes of objects as 'causes' or 'effects', he is referring to objects considered at the time

at which events are actually occurring in their histories; which is to say that whenever he postulates a 'cause' or 'effect' he intends to affirm the truth of the complex assertion concerning phenomena, which is implied whenever we assert the occurrence of one objective event correlated with another consistently with an universal rule.

So to defend Hume against the charge of the blatant error is, of course, in no way to justify his imprecision. That he should have made the charge possible is a serious enough criticism.

While the seriousness of this defect cannot be over-emphasised however, Hume cannot be denied credit for seeing the need to analyse experience and our assumptions about it far more clearly than any of his ~~successors~~ predecessors or contemporaries. If the analyses and solutions he offered are open to criticism, this is due, in some measure at least, to the fact that, having asked more questions than had occurred to any of his contemporaries or most of his predecessors, (219) he was forced to break entirely new ground in discussing them.

NOTES.

1). Cf.Reid's statements in the Dedication introductory to his Inquiry into the Human Mind - Works (1863) pp.95-6, his Inquiry - Works pp.102 & 3, and his letter to Hume (18th March 1763) Works 1. p.91; and Beattie's Essay on the Nature and Immutability of Truth in Opposition to Sophistry and Scepticism (1770) pp214-5. (The above are all quoted in Kemp Smith's 'The Philosophy of David Hume.' (Macmillan 1941) pp.4,5,6 & 7)

2). Cf.Kritik of Pure Reason Preface to the 2nd edition Bxvl (Kemp Smith's tr. - Macmillan 1933-pp.21-2)

3). The Philosoph of David Hume pp.8-12.

4). Ibid pp.11-12

5). Ib.pp.12-20

6). This is pointed out by Kemp Smith in 'The Philosophy of David Hume' pp.3-4.

7). Treatise 1.i.1. (1-7) (I shall use Kemp Smith's abreviations thoughout - thus 1.i.1 (1-7) = Bk.1. Pt.1 Sect.1 (Selby Bigge edition - 1946-pp.1-7).

8). Enquiry Concerning Human Understanding 11.17 (21-2 i.e. Sect.11. paragraph 17 (Selby-Bigge edition - 1936) pp.21-2.

9). Treat. 1.i.1 (1)

10). Ib.(1 - 2): Enq.11 11 (17) (Perhaps this criterion was suggested by Berkeley's Principles (30 & 33), though here coherence and constancy are listed among the distinguishing marks of sense data.

11). Treat. 1.i.1.(2)

12). Cf.Laird's criticism of Hume on this score - Hume's Philosophy of Human Nature Ch.1V.Sect.V. pp.114-6 (Methuen 1932)

13). Treat. 1.i.1.(2)

14). Ibid. (3-7)

15). Ib. (5)

16). Ib. (3-4)

17). Ib. (5)

18). 11. 13-5 (18-20)

19). Treat. 1.i.1. (5)

20). Ibid.; Enq. 11.15 (20)

21). 14 (19-20)

22). Treat. 1.i.1. (3-4)

23). 11.14 (19)

24). 1.i.1. (3-4)

25). Cf.Treat. 1.iii.11. (77)

26). 11.17 (22)

27). Treat.1.i.1.(5-6 Enq.11.16 (20-1)

28). Enq.11.16 (21); Cf.also Treat. 1.i.1.(6)

29). 11.17 (22)

30). V11 (Pt.1)49 (62)

31). Treat.1.i.1.(2) iii.1.(70)

32). For a further account of the inadequacy of Hume's analysis of thought in terms of images alone cf. infra.iii.(b) pp.369-70.

33). Treat.1i.1.(3)

34). Ibid.1.iii.X1V (157-61)

35). Cf.Treat.1.iii.X1V (165-6); Enq.V11(Pt11) 59 (75)

36). 1.iii

37). 1.iii.11 (73)

38). 1.iii.11 (73-4)

39). 1.iii.1X (107-10)

40). 1.iii.X1. (124)

41). 1.iii.11 (74-5)

42). 1.iii.11 (75-7)

43). 1.iii.11 (77-8)

44). 1.iii.111 (78-82)

45). 1.iii.111 (82)

46). Cf.1.iii.V11-X

47). 1.iii.1X (107-10)

48). 1.iii.X1-X111 (124-55)

49). 1.iii.14 (155)

50). 1.iii.1 (69)

51). 1.iii.1 (70)

52). 1.iii.1. (69)

53). 1.iii.1. (69)

54). 1.iii.1. (70)

55). 1.iii.1. (69)

56). 1.iii.1. (70)

57). 1.iii.1 (69)

58). 1.iii.1. (69-70)

59). 1.iii.1 (70)

60). 1.iii.1 (69)

61). 1.1v. 1 (180-1)

62). Introduction p24.

63). Ibid. pp.15-24

64). 1.iii.11. (75)

65). 1.iii.11. (75-7)

66). Supra Ch.1.pp.94,134-5

67). 1.iii.11. (75-6)

68). 1.iii.11 (76)

69). 1.iii.11 (77)

70). Cf.1.iii.V1 (86-94) 1.(69); 11(73-7); 14(155-72); 15 (173-4)

71). 1.iii.X1V (157); 1.1v. 11 (202)

72). 1.1v.11 (202)

73). Supra Ch.2 Sect.iii. (b) pp.186-7, 190-1.

74). l.iii.11 (75)

75). Ibid.

76). Supra ii.p.356

77). Supra ii.p.358

78). Supra ii.pp.358-9

79). Supra iii p.373

80). l.iii.11 (75)

81). Perception, Physics,and Reality Ch.11.p115 (Cambridge University Press 1914)

82). Ibid. p..106

83). Ibid. p.106

84). Russell: On the Notion of Cause (Mysticism and Logic pp.184-5); Kneale: Induction and Probability (Clarendon Press 1949) pp.62-3

85). l.ii.11 (30-1)

86). l.ii.11 (31)

87). Mysticism and Logic p.184; Probability and Induction pp.62-3.

88). Cf.Burtt; The Metaphysical Foundations of Modern Science Ch.V11.Sect.5.pp. 264-80

89). l.ii.11 (76)

90). Ibid.

91). Perception Physics and Reality Ch.11.p123

92). l.iii.11 (75)

93). Supra ii pp.349.356, ii (a) p.362

94). Supra (ii) p.351

95). l.iii.11 (76)

96). Perception, Physics, and Reality pp.121-2

97). Metaphysic Vol.11 Sect.207 (Cf.Perception Physics and Reality pp.122-6)

98). Supra iii.(d)(A)p387

99). Perception Physics and Reality Ch.11. pp.122-6

100). Ibid.pp.128-9

101). iii (e)(A)p.410

102). Supra iii(c) p.374

103). Supra Ch.2 iii.(b) p.189

104). l.iii.11 (77)

105). The Philosophy of David Hume Pt.11 Ch.1V pp.91-2

106). l.iii.11 (77-8)

107). l.iii.111 (78)

108). Supra Ch.l.1v pp.148-53

109). l.iii.11 (77)

110). Infra iii.(e) (C)p.418

111). l.iii.XdV (172)

112). Supra iii (d) (A) pp.382-8

113). Hume's Philosophy of Human Nature Ch.1V Sect.1 p.94

114). Ibid.Sect.11 p.96

115). l.iii.11 (79)

116). Ibid.(79-80)

117). Ib.(80-2)

118). Ib. (82)

119). In a letter dated by Grieg as written in 1754, and believed by Burton and Grieg to have been addressed to Stewart subsequent to the publication of his article 'Some Remarks on the Laws of Motion and the Inertia of Matter'. Letters i.p185 (quoted by Kemp Smith in The Philosophy of David Hume Appendix to Ch.XVlll pp.412-3)

120). l.iii.lll(79)

121). Ibid.

122). l.iii.lll(79-80)

123). l.iii.lll (79)

124). Supra Ch/4 Sect.lv p.314-5

125). Supra Introduction Sect.(ii) p.54 Ch.4 Sect.lv pp.321-2

126). Ch. 7.

127). For a detailed discussion of their use by these authors and other contemporaries cf. Laird: "Hume's Philosophy of Human Nature' Ch.lV Sect.Il i pp.97-9

128). Supra iii (e)(A) pp.408-10

129). Supra Ch.l Sect.lv pp.150-3

130). iii (a) p.363

131). l.iii.V (86)

132). l.iii.Vl (87)

133). l.iii.Vl (89)

134). Ibid. (89-90)

135). Ib. (90-1)

136). Cf.l.iii.Vll

137). pp.628-9

138). pp.96 & 628

139). l.iii.Vll (96)

140). p.629

141). pp.629, 636

142). Hume's Philosophy of Human Nature Ch.lV Sect.ll.v.p.112

143). Process and Reality p.188

144). V(Pt.ll) 39-40 (48-49)

145). l.iii.Vlll (98-9)

146). l.i. lV (11-13)

147). l.iii.Vlll (98-9)

148). Ibid.

149). i.iii.Vlll (99)

140). Ibid.

151). l.iii.Vlll (99-101)

152). l.iii. lX (107-8)

153). l.iii.lX (109-10)

154). l.iii. lX (110)

155). Ibid.

156). l.iii. lX (110-3)

157). Ibid. (113-5)

158). Supra ii.pp.349, 356; iii (a) p.362

159). The Philosophy of David Hume Pt.lll Ch.Xll pp.241-2.

160). Ibid p242

161). Ibid.

162). 1.iii.1X (115-7)

163). 1.iii.1X

164). 1.iii.X (118-23)

165). 1.iii.X (119)

166). 1.iii.X1 (124)

167). 1.iii.X1 (124-5)

168). 1.iii.X11 (143-55)

169). 1.iii.X1 (124-30)

170). 1.iii.X11 (130-42)

171). 1.iii.11 (75);
1.iii.X11 (132)

172). 1.iii.X11 (130-1)

173). Cf.1.iii.X11 (131-5)

174). 1.iii.X11 (142)

175). 1.iii.X1V (155)

176). 1.iii.X1V (155-6)

177). 1.iii.X1V (156)

178). 1.iii.X1V (157)

179). 1.iii.X1V (157)

180). 1.iii.X1V (157-9)

181). 1.iii.X1V (160)

182). 1.iii.X1V (161)

183). 1.iii.X1V (167)

184). 1.iii.X1V (168)

185). 1.iii.X1V (169)

186). 1.iii.X1V (170)

187). 1.iii.X1V (171-2)

188). 1.iii.X1V (171)

189). Ibid.

190). 1.iii.X1V (172)

191). Ibid.

192). The Philosophy of David Hume Pt.IV Ch.XXV pp.530-7.

193). Bk. 3Pt.1 Ch.XV11 P.685

194). Supra iii (d) p.362:
iii (e) (A) p.406.

195). Supra iii (e) (A) pp.406-8

196). V111 (80-103)

197). V11. (Pt.11) 60 (76-7)

198). V (Pt.1) 35-6 (42-4);
V11 (Pt.1) 50 (63), 52 (64-6),
54 (69-70); Pt.11.58 (73-4),
59 (74-6). 61 (78-9)

199). 1V (pt.1) 23 (27)

200). 1V (Pt.1) 27 (31-2)

201). E.A.Milne 'On the Origin of Laws of Nature' published in a supplement to 'Nature' June 1937 (quoted by A.J.Ayer in'The Foundations of Empirical Knowledge' Ch.1V p.203)

202). Aristotelian Society: Supplementary Proceedings Vol.X1V(1935)

203). 1V (Pt.1) 23-5(27-30) (Pt.11) 31 (36)

204). 1V (Pt.11) 33 (39)

205). 1.iii.XV1 (176-9)

306). V (Pt.1) 38 (46)

207). V (Pt.11) 44-5 (54-5)

208). V1.47. (57-9)

209). V11.(Pt.1) 52 (66-7)

210). V11 (pt.1) 52 (65), 53 (68)

211). Cf.Malebranche: Recherche de la Verité Bk. V1 Pt.11 Ch.3 (T.Taylor's tr.1700 p.56) & Eclairissement pp.171-2) (quoted by Kemp Smith: The Philosophy of David Hume Pt.11 Ch.1V pp.89-90)

212). V11 (pt.1) 55-7 (70-3)

213). VII(Pt.1) 49 (61-2)

214). VII (Pt.II) 59-60 (74-7)

215). VII (PtII) 60 (76-7)

216). Supra p.452

217). VII (PtII) 61 (78-9)

218). Supra Ch.1.Sect.i.(b) pp.85-6

219). In the Middle Ages Nicholas of Cusa had raised some of the question discussed by Hume, but the latter seems to have been unaware of this.

CHAPTER VII

KANT'S TREATMENT OF CAUSATION.

(i) General Introductory Remarks.

Since it contains both the most original, and the most fundamental, part of his teaching concerning 'causation', constituting moreoever his considered answer to Hume, I shall devote ~~most of~~ the space I am giving to the discussion of Kant, to the Kritik of Pure Reason. The interpretation, dating, and assessment, of this work all involve problems difficult of solution, and have, in consequence, provoked much disagreement among subsequent philosophers. Since adequate discussion of anyone of these factors, therefore, demands far more space than is here at my disposal, the ensuing pages can scarcely fail to sound dogmatic.

Many have held the first edition of the first Kritik to be an agglomeration of manuscripts written at widely separated times, and representing different positions. Notable among the exponents of this view are Adickes, Vaihinger, and Kemp Smith. There is however far from unanimity among these, as to the actual order of composition. This is not surprising as there is very little external evidence on this point. Nor can it be assumed that the Prolegomena and additions and alterations occurring in the second edition always represent a view approximating to that found in the latest sections of the first edition. For it is clearly possible to change or modify one's views after reflection, and then, on further consideration, to revert to one's earlier opinion. Indeed Vaihinger and, following his example, Kemp Smith (1) maintain the second edition to contain a retraction of the latest addition to the first.

It is indeed probable (as is admitted even by Paton (2) a critic of the patchwork theory) that the first edition contains many passages differing in date from their neighbours. That the second edition does so is indubitable. Moreover, the recognition of the need for revising and modifying earlier statements, and the willingness to carry out such revision, which is evidenced by the alterations found in the second edition and the Prolegomena, together with the time which Kant devoted to writing the first edition, render it more than likely that the finished product contained many emendations added throughout the period of composition. Moreover, it is to be expected that the Transcendental Deduction (in which Kant's patchwork method is held to be most evident) (3) should have been the subject of the most constant revision. For this section of the Kritik contains the most original and startling, as well as what was, in Kant's eyes, the most important, part of his doctrine. Nevertheless, Paton seems justified in protesting (4) against the assumption that the first edition is an arbitrary patchwork in which contradictory statements have been flung side by side. For it hardly makes sense to suppose Kant to have been content with this, after devoting so much time to achieving its final form. It seems quite preposterous to think he did not re-read the immediate context into which he was inserting an emendation as has been suggested by some interpretations. (5). On the other hand, since it is unreasonable to suppose he re-read the entire work every time he made an emendation, the habit of

constant revision would explain the appearance of inconsistencies between more or less widely separated passages.

Again with Paton, (6) I think the discrepancies within the first edition far less blatant and fundamental than has often been supposed. (7). The text seems to reveal not so much a hodge podge of contradictions as a struggle (attended with varying success) towards a characteristic and basically unitary theory. I think, therefore, that it is significant to speak in general terms of Kant's position or point of view. And this contention will, I hope be further justified by the ensuing pages.

(ii) Some Basic Elements in Kant's Answer to Hume.

Kant had no doubt that he was saving rationalism from the impasse revealed by Hume, in the only way possible; namely by a fundamentally revolutionary approach to the problem of knowledge. Clearly one must understand the basic principles of this approach in order to offer an adequate criticism, or account, of his arguments. And the recognition of that in which he agrees with his contemporaries and predecessors is as essential to this understanding as the realisation of that in which they differ. Indeed greater care and explicitness seems required in discussing the likenesses than in examining the differences, since it is easy to suppose Kant's revolution more far reaching that it is.

To Kant, Hume's failure to discover intrinsic connection between events is the beginning, not the end, of an adequate account of our knowledge of them; since for him it means, not the impossibility of any certain knowledge concerning their connection, but merely that the possibility of that knowledge is to be found by some method other than analysing the character of events or their mutual relations. For, to him, the importance of Hume's denial that we can justly regard a sentence as both analytic and as asserting connection between events, lies in its forcing us to recognise that a sentence which is not analytic may yet assert something necessarily true.

The importance Kant attaches to the distinction between necessary analytic, and necessary synthetic, propositions or judgments in itself presupposes one piece of common ground between Kant and the traditional rationalist: namely the conviction that there is a

non-verbalentailment. (8) For although, as has been seen, (9) verbal connections, insofar as they rest on arbitrary conventions, rest on synthesis, yet if necessity is properly attributable only to the outcome of verbal implication, all necessity rests on definition. On the other hand, if there can be a 'must' independently of linguistic rules, there seems no contradiction in supposing this need not be so. For example, granted the possibility of non-verbal entailment, there is no contradiction in postulating two simultaneous sequences AB and CD, A being such as to entail the simultaneous existence of C and the subsequent existence of B, while B is such as to entail the simultaneous existence of D, there being no intrinsic connection between C and D; but this is to postulate, in CD, a sequence necessary in the sense that it cannot but occur although this is entailed neither by the character (and hence the definition) of that sequence as a whole, nor by that of any of its members taken singly.

That Kant supposed necessary synthetic propositions might assert non-verbal entailment is plain from his claim to achieve by their means certainty concerning principles governing the behaviour of ships, houses, etc., and not merely conclusions about our manner of talking of them.

Kant ordinarily confines the terms 'analytic' and 'synthetic' necessity to judgments. To avoid confusion, I shall follow his example in this, applying the terms 'intrinsic' and 'extrinsic' to the necessities or entailments he supposes asserted by 'analytic' and 'synthetic' judgements respectively.

The notion of necessity extrinsic to that to which it is ascribable has been seen (10) to be no innovation on Kant's part, being indeed recognised both by plain men and earlier philosophers. And the supposition that it can save inductive inference, by avoiding the latter's appeal to intrinsic necessity, has been seen to be in vain. (11)

Kant, indeed, does not think analytic logic irrelevant to the demonstration of synthetic necessity, but he supposes it capable of serving the merely subsidiary function of clarifying the concepts used. (12) He further insists that the recognition of synthetic necessity is revolutionary in its effect: thus, for instance, after having defined the role of analysis in metaphysical enquiry as purely subsidiary, he affirms the intention of applying 'a method entirely different from any hitherto employed'. (13) This at least suggests that in extrinsic necessity he recognises a 'must' completely different from that demonstrated by means of analytic logic.

Since Kant has so evident a regard for traditional logic, this probably was not his intention. Whether it were or not, however, the suggestion remains and is, I think, disastrously misleading, both in itself, and in relation to the interpretation of Kant. For, it seems to obscure the essential difference between the two types of necessity discussed by Kant, no less than their likeness. In practice, Kant treats analysis as an integral factor in the demonstration of extrinsic necessity; the difference between the demonstration of intrinsic necessity, as

he describes it, and that of extrinsic necessity as he practises (or attempts to practise) it, lying not in analysis being essential to the one and incidental to the other, but in the subject of the analysis which is integral to each process. Kant is explicit in affirming intrinsic necessity to be demonstrated by analysis of the character of that of which it is proved. And, whatever he may, or may not, say about extrinsic necessity, the Kritik of Pure Reason has been seen (14) to be, in effect, devoted to the demonstration of extrinsic necessities by analysis of something other than that of which it claims to prove them; since it seeks to demonstrate extrinsic necessities in the objects of knowledge by analysing the character of experience in general, and those of specific types of experience. Thus Kant's practice (like that of the plain man and earlier philosophers when employing the notion of extrinsic necessity, either explicitly or implicitly) presupposes that just as non-verbal intrinsic necessity is entailed by the character of that of which it can truly be asserted, so extrinsic necessity is entailed by the character of something other than this.

The fact that extrinsic necessity, when postulated, is, and must be, assumed to be entailed thus indirectly, reveals Kant's justification for calling its assertion a synthetic judgment and regarding synthesis as essential to extrinsic necessity, its comprehension, and demonstration. For clearly, to say that A has no intrinsic connection with B, is to say that the character of A could not be supposed to entail anything concerning B save

in virtue of some relation between them. And in order to understand or demonstrate such entailment it would be necessary to be aware of that relation, which would be to synthesise distinct notions or ideas; as well as to analyse both the relation and at least one of its terms. Synthesis and analysis are thus inextricably interwoven in the comprehension and demonstration of extrinsic necessity (if there be any such to be comprehended and demonstrated), intrinsic entailment and synthesis being equally inseparable in the exemplification of extrinsic necessity if this ever occurs.

There is one important feature of Kant's account of extrinsic necessities, in which it differs from the analyses typical of Leibnizean rationalism. He claims to base his conclusions, not on the intrinsic character which any experience must have, but on that of human experience as he has found it. Indeed he admits the possibility of other types of experience which would not fulfil all the conditions of human experience. (15) That is to say, the subject of the analysis on which his conclusions rest is not a purely abstract concept, but the nature of something actually given. This I think is what originally prompted his description of Leibnizean rationalism as 'dogmatic' in a derogatory sense, although in fact he sometimes uses 'dogmatic' simply as synonymous with analytic' (as, for instance, when he asserts the impossibility of proving dogmatically the truth of the proposition that there is a permanent in all appearances, on the ground that it is synthetic). (16).

The role of intrinsic necessity, and that of synthesis, as condition of extrinsic necessity, has each an important consequence.

In the first place, since non-verbal intrinsic necessity is an essential condition of extrinsic necessity, clearly the notion of the latter cannot serve to defend the postulation of non-verbal necessity from any valid objection in principle against that of the former. On the other hand, if defensible in principle, the notion of extrinsic necessity has the advantage claimed for it by Kant, namely of being capable of rendering necessity demonstrable where, (either on account of its absence or of our inability to prove its presence) we are unable to demonstrate intrinsic necessity.

Secondly, owing to the dependence of extrinsic necessity on synthesis, the notion of such necessity, if acceptable, gives importance to the relational judgment in providing it with an indispensable function in its own right. Surprisingly, this does not seem to have been fully realised by Kant, since he continues to regard as sacrosanct the traditional logic to which the proposition or judgment is always, properly speaking, attributive.

The argument of the Transcendental Aesthetic and Analytic, in which Kant seeks to demonstrate extrinsic necessities in the objects of knowledge, may be briefly summarised as follows.

It is impossible to know anything about things as they are in themselves independently of experience, since clearly we can know

something only as it is presented to our experience.(17) This, however, so far from limiting our knowledge, renders certainty possible where it would not otherwise be so. For example, Hume has shown the impossibility of obtaining by analysis of either the events, their relation, or both, knowledge which is necessarily true concerning the occurrence of events; since, however, we can know nothing save as it appears in our experience, the analysis of that experience can reveal conditions to which any event, insofar as it is an object of knowledge for us, must conform.(18) There are two main types of conditions to which all objects of our experience must conform, namely sensible and logical. There are two sensible conditions-space and time. All the objects of our experience must stand in temporal relations one to another; and though all objects of our experiences are not spatial, it is clearly integral to our experience as such that some should be. (19) These sensible conditions are not necessary prerequisites of any experience, it is possible that there might be other sensible conditions to which other types of experience might conform. (20) To the logical conditions, on the other hand, any object of non-intuitive understanding must conform.(21) These latter are ways in which we cannot but think of anything if it is to be an object of knowledge for us at all. They are twelve, corresponding to the twelve types of judgment differentiated by the traditional logic. Kant is thus seen both to regard the traditional twelvefold classification of judgments adequate, and to think each of the types it specifies an expression of one of the ways in which we must think of objects of knowledge.

Kant reveals his respect for the traditional logic yet further by referring to these logical conditions as categories. Since these latter are conditions of thinking of an object of any sensible experience, their application to our own particular type of experience must be further specified. Indeed we can fully understand a logical condition of experience only by seeing how it determines a given type of experience.(22) As all the objects of our experience are temporally related, to say that we must think of any object of our experience in terms of the categories is to say we must think of it in terms of the categories as these condition the temporal.(23) (23) Categories so regarded Kant describes as schematised. Of these the three most relevant both to this thesis, and to Kant's answer to Hume are substance, causality, and reciprocity; Kant's postulating their validity constitutes the assertion that we must think of every object of experience as having a permanent substratum, as being an element in a system in which every event is preceded by another on which it follows necessarily, and as being coexistent with other objects between which and itself there is interdependence. (24)

In the latter part of the Kritik, Kant also states that we use terms which, as we define and use them, are applicable to no possible object of our experience, our use of them amounting to the assertion of principles which regulate our pursuit of knowledge. In effect, they prevent our regarding any empirical findings as giving a complete or unconditioned picture. Kant himself, of course, does not simply write of our using words in this way, he says we have ideas constituting such regulative principles.(25) To discuss what he meant

by 'idea' in this context, and whether he was justified in using the term so, would however, involve a longer discussion than is warranted here. (25)

It has been held (e.g. by Kemp Smith) (26) that the Kritik reveals two conflicting views: (a) a subjectivism regarding all phenomena as merely the content of individual experiences; and (b) a phenomenalism which postulates objective existents which are both distinct from things in themselves and independent of individual experiences.

This theory does not recommend itself directly. It seems prima facie improbable that a philosopher of Kant's ability should be unaware of a glaring inconsistency in his writings. Certainly he is vigorous in stating apparent contradictions, as in the Antinomies, but he does so only in order to reveal the inadequacy of the positions involving them, in this and in his general attitude showing himself enough of a rationalist not to wish to publish blatant inconsistency.

At the same time Kemp Smith's view is by no means unfounded. There are numerous passages in which Kant asserts our knowledge to be limited to what is given in individual experiences, things as they are independently of our experiencing them being unknowable, (27) which seems a clear enough statement of subjectivism. And, on the other hand, he insists on the possibility of distinguishing subjective and objective within our experience, actually basing his proofs of causality and reciprocity on our recognition of this distinction, and speaking of ships, houses, and the phenomenal

world in general as though they had an existence independently of our experiencing. (28) There are, however, two ways in which Kant could have combined these apparently conflicting views, without contradiction.

In the first place he could have maintained a Berkeleian position, holding that, although there exists nothing but things as they are in themselves (which we cannot know) and our own subjective experiences, the plain man, in differentiating 'objective' and 'subjective' is recognising a real distinction within those experiences. He could then have proceeded to analyse the two aspects of experience thus distinguished, finding that whenever we normally assert objectivity a certain system is to be found, which is absent when we refuse to do so. And he could further have discovered one distinctive type of systematisation wherever we assert 'objective sequence', and another wherever we assert 'objective coexistence'. He could, for convenience, have decided to use the terms 'objective' and 'subjective' to describe the presence and absence, respectively, of systematisation in experience; further using the terms 'objective sequence' and 'objective coexistence' to differentiate the two principle types of systematisation discoverable there. He might then have drawn conclusions from the recognition of this systematisation. For instance, he might have defended the postulation of 'causation', in the sense of a specific type of correlation within experience, by saying that this is what we assert, and all we are entitled to assert, in postulating objective sequence - our distinguishing

objective sequences, thus presupposing the truth of its assertion.

Alternatively, he could have maintained things in themselves to stimulate our objective experience just as electrons and protons (regarded as imperceptible continuants) are commonly held to do, the phenomenal world being thus constituted by these as they appear to us just as my reflection in a distorting mirror is ordinarily regarded as me as I appear through that medium. In other words, he could suppose, for instance that when we truly say we perceive a chair, a thing in itself is impinging on our consciousness but that, owing to our manner of experiencing, this can affect us only as though it were a spatio-temporal object having a given size, shape, weight, colour, degree of penetrability, duration and spatio-temporal position or set of positions; although it need not always appear to have the same. (It might, for instance, affect us on one occasion as though it were an object having four legs, and on another as though having only three). The phenomenal world can thus be regarded as possessing objectivity in the sense of independence of particular acts of perceiving (just as my reflection in a distorting mirror may be seen by anyone looking in it while I am reflected there), while at the same time dependent on a mode of experiencing as well as being describable and knowable to us only in terms of the content of particular experiences. (It should be noted that if we cannot know the characters of things as they are in themselves, we are no more entitled to deny than to assert their likeness to the characters of things as they appear to us).

The first of these two points of view clearly presents the fewest difficulties. For once one asserts the complete unknowability of things in themselves, restricting all knowledge and significant assertion on our part to the realm of appearance, it is difficult to see how the postulation of anything outside that sphere can be justified at all, let alone the assertion of any relation between such an one and experience. And, in addition to its inconsistency with the restriction of our knowledge to objects of experience, the supposition that phenomena are in any way dependent on things in themselves seems in blatant contradiction to Kant's naming 'causality' as a category (29) and at the same time insisting (30) that the categories can be significantly applied only to actual or possible objects of experience. Indeed, the very postulation of things in themselves might provoke a like objection since 'reality' is one of Kant's categories. (31)

Nevertheless, in spite of the difficulties which the second position involves, I think it is that adopted by Kant. Nor do I think this is necessarily to ascribe contradiction to him.

There are several reasons for supposing Kant held the second of the views that I have outlined, rather than the first.

In the first place the purely subjectivist view is virtually the position of Berkeley, which Kant explicitly and forcefully condemns.

Secondly, on this view, to call a perception sequence objective is simply to call it necessary in the sense of irreversible, and hence to assert all objective sequence to be necessary, i.e. 'causally determined' in Kant's use of the terms, is to give no information save concerning words. And it seems clear that Kant in vindicating the Second Analogy supposed himself to be, not formulating definitions, but justifying the belief that a certain type of order has been, and will continue to be, discoverable within experience.

Again, though it may be a convenient shorthand to use the term objective in the customary way, though supposing it to refer to nothing but actual and possible experiences, it is clearly misleading to intend this unusual interpretation without mentioning the fact. Presumably Kant, in recording his views, wished to communicate them; it seems, therefore, unreasonable to suppose him to use, without explanation, phrases which will naturally be interpreted in one sense, while in fact intending them in another.

Lastly, and most convincing of all, though there are passages which could be interpreted in terms of the Berkeleian view (the proof of the Second Analogy added in the second edition, (32) and the fifth occurring the first, (33) being perhaps two of the most important) there are many statements wholly inconsistent with it, (Since I am mainly concerned with the Second Analogy, I shall confine myself to examples found in its discussion).

Thus, in the definition of objectivity introducing the discussion in the first edition, Kant writes: 'in spite also of the fact that their representation in apprehension is always successive, I have to show what sort of a connection in time belongs to the manifold in the appearances themselves'. (34) Clearly, if to talk of appearances is merely to speak of a certain regularity, actual and possible, among experiences, one could not speak of connections in appearances as distinct from those found among experiences. The insistence on this distinction appears again at the end of the paragraph when Kant formulates conditions necessary in order 'that appearance, in contradistinction to the representations of apprehension, can be represented as an object distinct from them'. And midway between the two explicit assertions of this distinction, Kant instances our refusal to attribute to 'the parts of a house', the succession in the experiences of perceiving them, not in order to condemn or explain away this differentiation, but as something which his theory must accept and account for if it is to prove adequate.

Again in the first proof of the Analogy in the first edition, he says that in perceiving objective succession 'we must derive the subjective succession of apprehension from the objective succession of appearances'; and a little later supports his claim to a criterion of objectivity other than the succession of experiences by arguing; 'Since the subjective succession, by itself, is altogether arbitrary, it does not by itself prove anything as to the manner in which the manifold is connected in the object'. (35)

But there would be no other succession whence the subjective could be derived, nor any other connection to be proved, were the Berkeleian view correct.

Similarly in the second first edition proof, he writes: 'Let us suppose that there is nothing antecedent to an event upon which it must follow according to rule. All succession of perception would then be only in the apprehension.....
I could not then assert that two states follow upon one another in the appearance, but only that one apprehension follows upon the other'. (36)

And in the fourth first edition proof we find: 'A series of appearances thus arises which, with the aid of the understanding produces and makes necessary the same order and continuous connection in the series of possible perceptions as is met with a priori in time'. (37)

Thus there appears again and again an insistence on two distinguishable sequences, which is completely irreconcilable with the suggestion that Kant is writing of nothing but actual and possible experiences.

Certainly this distinction might be maintained consistently were objective sequences supposed to consist in sense data which may both be perceived and persist unperceived. I think no one has ascribed this view to Kant. There is no indication that he held it, nor could he have done so consistently with his assertion that our manner of experiencing determines the character of the objects of experience. For this would mean we have no right to

suppose unperceived sense data to resemble those experienced. And it would be a contradiction in terms to say that a sense datum persisted unperceived but, for all we knew, appeared to us different from its natural self, since there is no criterion for attributing persistence to a sense datum apart from persistence of its characteristics.

The view I am attributing to Kant has some affinity with the 'phenomenalist' position which Kemp Smith professes to find in some passages. Thus, speaking of the objects apprehended, as they are regarded on this view, he says: 'They are part of an independent order which in the form known to us is a phenomenalist transcript of a deeper reality..... Its (the phenomenal world's) function whether as directly experienced through sense perception or as conceptually reconstructed through scientific hypothesis, is to stand as the representative in human consciousness of that noumenal world in which all existence is ultimately rooted'.(38)

Here, as in my interpretation, the dependence of phenomena on noumena is affirmed; but the two interpretations differ in the greater degree of independence of experience attributed to phenomena on Kemp Smith's 'phenomenalist' view. Indeed Kemp Smith writes as though, on this view, the characteristics of phenomena were determined, not by our manner of experiencing, but by things in themselves. Thus he writes: 'If the causal relation is analogous to anything outside itself, it is an analogon or interpretation of dynamical powers exercised by things in themselves', though he adds, in a footnote, that Kant

recognised the impossibility of asserting this positively on critical principles. (39) And a little earlier he describes 'the fixed order in which concrete events are presented to sense perceptions' as 'due to noumenal conditions'. (40) This is surely completely contradictory to Kant's repeated insistence that the character of phenomena, as things as they appear to us, is wholly determined by our manner of experiencing and thus, and thus only, discoverable by us.

Complementary to the postulation of an objectivism in Kant which asserts an intermediary between thing in itself and particular experiences, independent of our experiencing; is his attribution to Kant of a subjectivism in which the postulation of any intermediary between them is out of place.

In the extreme character of either of these interpretations lies the explanation of Kemp Smith's attributing two conflicting views to Kant. For the existence of a phenomenal world independent of our manner of experiencing is plainly inconsistent with the truth of many of Kant's statements; while a subjectivism allowing of no intermediary between perceptions and thing in itself is obviously inconsistent with Kant's postulation of an objectivity which is not merely the exemplification of a rule of correlation among particular perceptions.

Earlier pages should have made clear my rejection of Kemp Smith's position. I have no room for a detailed destructive criticism of his thesis, but will briefly discuss his treatment of one passage to bring out what appear to me as confusions

underlying it, and weaknesses in his exposition in terms of it.

In discussing A29-30 (41) Kemp Smith instances as an example of the phenomenalist standpoint the earlier paragraph which distinguishes taste and colour as 'subjective', from space (or spatial relations) as 'objective'; while he treats the succeeding paragraph, in which Kant insists that space is a character of experience only and not of things in themselves, as exemplifying the subjective tendency. It has already been argued that even granted that the appearance of inconsistencies in a work the length of the Kritik is not improbable, blatant contradiction between two adjacent paragraphs would show their author to be a very different person from that revealed by Kant's writings.(42).

And it seems quite clear to me that, when Kant distinguishes subjective from objective as he does in A29 and in vindicating the Analogies, he is intending to refer to a distinction within appearances in his sense of the term, that is to say within the conditions under which our actual experience occurs; whereas in A30 he is intending to emphasise that this is so, that the objective of which he has just written is so only relatively and is not 'objective' in the sense of existing in complete independence of our mode of experiencing. That this interpretation is correct seems to me borne out, not only by the wording of the paragraphs in question, but also by that of the one preceding them, (A28) For it is immediately after insisting in A28 that space is nothing at all unless regarded as a characteristic or condition of possible experience, that he proceeds to differentiate it from secondary

qualities. Indeed, he starts to assert the difference, (immediately after discussing space so that the opening 'this' clearly refers to the latter, as indeed it obviously does from the sense of the sentence) by writing: 'This subjective condition of outer appearances cannot, therefore, be compared to any other! While the paragraph which replaces this in the second edition opens with the assertions: 'With the sole exception of space there is no subjective representation, referring to something outer which could be entitled objective and a priori'. (43) (The underlining in each quotation is mine) From this it seems clear that, not only at the time of the final formulation of the first edition, but also when he wrote the second, Kant regarded space as subjective in an absolute sense- although within the subjective content of experience he recognised a relative sense in which it could be regarded as 'objective' in contradistinction to other elements in that experience. To overlook the relative character of 'objectivity' as used thus by Kant seems to me a confusion as serious in its consequences as in its extent.

Since, indeed, it is the essence of Kant's 'revolution' that knowledge of objects is relative to experience, and the bulk of the Kritik is devoted to showing this to be so, it would be surprising to find intentional denials of this within the Kritik itself. Kemp Smith himself admits (44) that what he calls the subjectivist point of view (which, insofar as it affirms the dependence of phenomena on our mode of experiencing them, resembles that I am attributing to Kant) is that most frequently met in the

Kritik, and that, therefore, if this work is to be regarded as presenting a consistent body of doctrine this can only be subjectivism. And again, in discussing the Second Analogy he admits that 'the' phenomenalist view of the causal relation receives no quite definite formulation' anywhere in the Kritik.(45)

Although he follows Kemp Smith so far as to speak of 'subjectivist' and 'phenomenalist' or 'more objective' views within the Kritik,(46) Ewing seems to intend to express something of that asserted above—as he writes that the physical 'can only be understood as a mental image which is, however, public not private property'. (47) Ewing's language here is unfortunate, since in the ordinary sense of the term an 'image' (particularly when described as 'mental') is essentially private. But Ewing is evidently trying to maintain, as I have done, that while the phenomenal 'objects' of which Kant speaks can be described and conceived only in terms ofprivate experiences, they are still something which anyone may experience under the appropriate conditions.

The attribution of some form of 'causality' to things in themselves seems to present the greatest difficulty in my interpretation of Kant. Whatever criticism of the view I have attributed to him it may provoke, however, it cannot be regarded as an adequate reason for refusing to attribute this view to Kant. For despite all he says about restricting the categories to objects of experience, his solution of the problem of free-will (to him a most important element in his philosophy, and hence, presumably,

well-considered) lies in attributing freedom to a thing in itself underlying the phenomenal self,(48). But if Kant is not averse to regarding the phenomenal as in some sense dependent on things in themselves, can he escape the charge of inconsistency in this? I think he can.

In the first place it seems clear that when Kant,in discussing free will, asserts phenomena to depend on things in themselves, he is not intending to apply the category of causation. For the categories, as he conceives them, are not characteristics of things, but ways in which we must conceive anything if we are to regard it as an object of knowledge. But clearly Kant cannot justify the, to him all-important, belief in free-will by appeal to the 'causality' of things in themselves,if by this latter he means simply one of the ways in which we must conceive them. If his argument is to be effective he must be saying something about, not the way his mind works, but things in themselves. And there seems no doubt that he intended to make the latter type of assertion in postulating 'causality', in the shape of free-will. Nor indeed would he be talking about things in themselves at all were he talking of how he must conceive them, since,in his terminology, a thing in itself is a thing as it is independently of our manner of experiencing, conceiving, and knowing. (The charge that in saying things in themselves exist, Kant is applying the category of 'reality' to them, could be similarly answered).

Furthermore, Kant's defence of the Second Analogy, the principle underlying the schematised category of causation, leaves

no doubt that by this category he means the inability to conceive any object of knowledge as uncaused; that is to say that to apply it to anything is to regard this as an 'effect'. Indeed he insists that the category does not by itself enable us to say this is the 'cause' of that.(49) But when he speaks of 'causation' in relation to things in themselves, in discussing free-will, he is asserting them to be 'causes' not 'effects'; and I am supposing him to be doing the same in ascribing 'causality' to them in his view of objective experience.

Kant, therefore, invites a charge of inconsistency in regarding things in themselves as 'causes', only if he asserts or implies either that we know absolutely nothing outside the realm of experience or that the term 'cause' can be significantly used only when the category is applied.

As to the former Kant could have evaded a charge of inconsistency by admitting to one of carelessness; namely by affirming that in asserting the restriction of our knowledge to the sphere of experience he meant only that there is a reality underlying objective experience, of which we can know nothing save its existing and stimulating that experience. And, indeed, since Kant is ~~both~~ unequivocal in asserting the existence of things in themselves; ascribes causality to them in the, to him all-important, sphere of moral responsibility; affirms them to be the ultimate source of sensation; and, as I have just argued, treats objectivity in a manner consistent only with their being the ultimate sourde of stimulus of objective experience; it seems but reasonable and

just to suppose him to have intended the more qualified definition.

That the term 'cause' can be significantly used only when we can apply the categories is nowhere stated explicitly by Kant. Nevertheless, his repeated insistence that for us thought is empty unless understood in terms of the sensible, might well seem to imply that we can say nothing significant concerning things in themselves. But here again he could (and probably would, if challenged) have avoided inconsistency by maintaining a qualified form of his restricting statement. Thus he could have said that thought not understood in terms of the sensible, though intelligible in a restricted sense, was empty of information we usually expect to derive from it; maintaining further that his intention in insisting on this emptiness was, not to deny the modicum of intelligibility involved, but to safeguard against false pretensions to knowledge in supposing the customary information or its equivalent to be implied where this is absent. For instance, he might have said, if I assert the existence of a chair, I am giving information about possible experiences and postulating an existent of a given sort defined in terms of those experiences; whereas if I assert the existence of a thing in itself I am saying nothing about possible experiences but am merely positing a something of whose nature, and of the implications of whose existence, I know nothing. Similarly, he could have said, whereas if I assert a causal connection between a man's taking a given quantity of arsenic and his subsequent death, I

am saying something about possible experiences, and am asserting a precisely specifiable relation, namely necessary connection between two events whose character and connection I conceive in terms of those experiences; in calling a thing in itself 'cause' of phenomena I am saying nothing about possible experience, and hence have nothing from which I can derive any precise idea of either the relation involved or the nature of one of its terms— namely the unknown thing in itself. Our 'understanding' that phenomena derive from things in themselves is thus akin to the child's 'understanding' that if he presses a switch the room will be lit though he has no idea how or why this should be so; and Kant's warning about the emptiness of thought not understood in terms of the sensible is directed against confusing this latter type of 'understanding' with that involving knowledge of some precise implications of a statement.

To maintain, as I have done, that Kant could have held the view of objective experience here attributed to him, without inconsistency, is not of course to say that he was justified in holding it. To justify it would indeed be difficult. Kant himself, though he devotes much energy to defending the relativity of phenomenal knowledge and the impossibility of our knowing the nature of things as they are in themselves, seems quite unaware of any need to defend his postulation of the latter or their affecting our experience. This I think is due to two main influences, those of the Leibnizean conception of phenomena as the inadequate appearance to us of underlying realities, and of

the subjectivist view of secondary qualities (stimulated by modern physics). The familiarity of both these notions of a reality underlying, and utterly unlike, its appearance to us would naturally tend to conceal the need for defending his postulation of the thing in itself.

Were he pressed, he would probably have argued that unless what we call 'objective experience' were the appearance to us of things in themselves independent of our experiencing, we should be unable to distinguish it, as we do, from 'purely subjective experience'. To this it could be objected that since the experiences we call 'objective' have a certain distinctive orderliness in their mutual relations, we could thereby distinguish them from those we call 'subjective' without appeal to anything else. Kant could have answered this effectively, only if he could have shown that this orderliness cannot be discovered from actual experiences alone, past as well as present, and those of others as well as one's own, but can be asserted only if 'objective experience' is the appearance to us of entities independent of us, the nature of whose effect on us is nevertheless determined by our mode of experiencing. And in order to justify his position he would have needed further to show not only that he could consistently admit the possibility of speaking significantly of things in themselves and their causality, but also that it is indeed possible to speak significantly of the dependence of phenomena on things in themselves while ignorant of both the nature of things in themselves and the precise character of the relation asserted. This indeed is the point on which he

would meet the greatest criticism.

That the source of objective experience is reality, independent of our experiencing, does not of course entail a plurality of existents thus independent, much less that there is one such corresponding to every existent justly postulated by commonsense. Nevertheless it must be admitted that Kant's persistent reference to this reality as a plurality i.e. as things in themselves, together with his treatment of free-will, suggest that he held each phenomenal 'object' to be the appearance of a distinct non-phenomenal reality.

It should be needless to insist that to define objective experience in terms of the appearance to us of things in themselves is not to attribute to things as they are in themselves any of the characteristics they appear to us to possess. To say that to a jaundiced person everything appears yellow is to say nothing of the objects of his experience beyond his manner of experiencing them. Similarly, to say that in observing objective sequence we perceive things (in themselves independent of our experiencing) appearing to us as though exhibiting a serious of events, is not to say that those things as they are in themselves actually exhibit such a series. On this view the objective is so, in the sense of being public rather than private, only in that anyone of our manner of experiencing would make the same 'world' out of our data. Since the 'making' involved lies in our manner of experiencing as such, ~~so that~~ 'given' and 'data' are not here being used in the sense in which they are ordinarily applied to something presented

to consciousness. Things in themselves, on the Kantian view as I interpret it, as has been suggested, (50), are data in the sense in which electrons and protons, as commonly regarded, would be: namely as something we so deal with, in experiencing it, as to represent it to ourselves as though it had characteristics we have no ground for ascribing to it. (In the case of a world of electrons, of course, one has positive grounds for not ascribing to it the character of the universe of everyday experience). And when we properly apply the categories we are conceiving in terms of them, not things in themselves, but what we make of data supplied by them in this sense. We could not regard experience as objective in this way unless it was both so stimulated by things in themselves and so conceived in terms of the categories by us; Kant, I think, explicitly insists only on the latter condition because he takes the former for granted.

(iii) The Second Analogy.

Kant postulates twelve 'Principles of the Understanding' (51) which he describes as 'rules for the objective employment of' the categories; that is to say they are the principles underlying the schematised categories, rules exemplified in our manner of thinking or conceiving the temporal. Three of these principles he calls Analogies of Experience; this title appears to have been adopted because Kant supposes that they enable us to make assertions such as that as A is related to B so is C to a fourth term not given i.e. to assert the existence of one relation analogous to another even though we can discover only one term of the former. He also speaks of them as analogies of the purely logical principles underlying the categories taken in abstraction; I incline to Kemp Smith's opinion, (52) however, (though not wholly for the same reason) that this is urged as an additional defence of the title rather than constituting Kant's actual ground for applying it. The purely polemical nature of this interpretation of the term seems clear to me from the fact that Kant cannot, properly speaking, regard any of his 'Principles of the Understanding' as analogous to the principles underlying the pure categories, since the former in fact consist in the latter subject only to certain conditions.

The Analogies of Experience consist in the principle of permanent substance, that of causality in the sense of necessary sequence, and that of reciprocity in the sense of the interdependence of the coexistent. The second of these is the most relevant to my purpose, not only because it concerns Kant's use of the term

'cause', but also because it constitutes the specific answer to Hume's criticism of the concept of 'causality, and is Kant's most significant contribution to the history of that concept.

Kant's defence of 'causality', in vindicating ~~of~~ the second analogy is generally held to consist in six separate proofs, five of which are regarded as merely varying formulations of the same argument. (53) This multiplicity of proofs, particularly when regarded as mainly repetitious, has been urged in favour of the composite origin of the discussion. (54) Paton, however, is as usual critical of the general view, (55) holding not only that the discussion may be regarded as a continuous whole, but also that what is usually thought the one different proof is far from alien to the general trend of the argument.

That the discussion is repetitious cannot be denied, but this characteristic is equally consistent with either its composite origin or a desire on Kant's part merely to emphasise its salient points and make them explicit. Moreover, I think the argument's meaning and validity may be discussed without reference to its mode of composition. I shall not, therefore, discuss this latter, whose adequate treatment demands more space than is here warranted.

Whatever view of its method of composition may be held, I think Paton right in refusing to regard the five proofs generally classed together, as mere variations of the same theme, and in supposing Kant finally intended the six proofs to form together a continuous argument; I hope to justify this view in

the course of what follows.

Five of these proofs (including that usually regarded as unique) appear in the first edition, the sixth being prefaced to these in the second.

(a) The First First Edition Proof
(A) The Prefatory Discussion of Objectivity.

The first proof in the first edition is prefaced by a definition of objectivity. (56). This is very necessary since, as has already been remarked, (57) while Kant's defence of 'causality' rests on our distinguishing 'objective' from 'subjective' within experience, his view of the phenomenal world constitutes a denial of the adequacy of the then commonly accepted concept of objectivity. I have already outlined my view of Kant's solution of the dilemma. The passage at present under review is by no means as explicit as the commentator might wish, as is witnessed by the conflicting assessments and interpretations it has been given; (58) yet I think, not only that it is consistent with the interpretation I have put forward, but also that only on that interpretation can it be regarded as either self-consistent, or consistent with Kant's teaching in general and the discussion it prefaces in particular.

I will first outline the argument of the passage as it stands, and then enlarge upon it in terms of my interpretation, endeavouring to justify the latter.

Kant starts by making explicit his rejection of the accepted conception of objectivity on the ground that we can know only

'appearances'. He recognises that we yet undeniably distinguish 'objective' from 'subjective sequence'; we see 'the different parts of a house' successively, but we assert 'the parts of a house' to be coexistent; and he addresses himself to account for this distinction in critical terms as follows. Given that all we can know is mere appearance, the undeniable distinction commonly described as being between 'subjective' and 'objective' can only be between the contents of particular experiences and 'appearance' which, though nothing apart from the sum of such experiences, is yet distinguishable from them as that given in them and their object. This distinction is only recognisable if 'appearance' is regarded as exemplifying a rule which both distinguishes it from any other factor within experience and entails the order of particular experiences; 'appearance in contradistinction to the representations of apprehension, can be represented as an object distinct from them only if it stands under a rule which distinguishes it from every other apprehension and necessitates some particular mode of connection of the manifold. The object is that in the appearance which contains the condition of this necessary rule of apprehension'.

Prichard regards this passage as identifying 'appearance' with actual experiences 'related in a certain necessary way'. The passage, he says reveals the impasse to which Kant is reduced by refusing to recognise the true nature of apprehension as essentially awareness of reality. Now he finds himself faced with the necessity of supplying the object of apprehension which

his teaching excludes, and so is forced to offer the totally inadequate substitute of ideas, with the sole proviso that they are perceptions related in a certain way. To this, says Prichard, there are two fatal objections; in the first place, perceptions are essentially subjective, a complex of them no less than a single one; and secondly, on this view, perceptions may be related both by sequence as subjective, and by coexistence as objective. Prichard therefore concludes that Kant 'is unable to justify the very distinction the implications of which it is his aim to discover'. (59)

From what has been said above it will be inferred that I reject Prichard's interpretation of the passage in question; moreover, I think that even were it sound, his criticisms would still be open to objection. I shall discuss first his criticisms, and then his theory.

The fundamental postulate of Prichard's criticism, as he interprets it, involves a confusion; and his two fatal objections can be understood as such, only if a plainly contradictory view of objectivity is attributed to Kant without supporting evidence.

The basic confusion seems pretty evident. Prichard is assuming that to define apprehension as awareness of an object (as Kant and most other people do, at least implicitly), is to define it as awareness of something as existing independently of being experienced, and as it thus exists. This is surely false. For ther is no contradiction in asserting awareness of a mental content or subjective state. And, indeed, that we can be aware

of subjective states cannot be denied by anyone adopting the commong interpretation of 'awareness', and supposing us directly aware of anything. For, whatever view of sensory perception is adopted and whatever we may be said to be aware of in 'observing a physical object', it is impossible to assert such 'awareness of a physical object' justly without being bound to assert also awareness of certain experiences; for example, if I am thus aware of a blue sky, I am aware of experiencing a blue sense-datum. And, if we can thus be said to be aware of anything, there are occasions when it is true to say that one is aware of the purely subjective: for instance, when he has a toothache which, though it may be supposed 'caused' by something existing independently of his experiencing, does not exist anywhere outside his experience; or when one 'sees double'.

As to the first of the specific 'fatal objections', this is an effective criticism of the indentification of the objective with experiences correlated in a certain way, only if objectivity is not defined in terms of the correlation experiences. For this identification implies some mysterious transformation, only if the objective is something more than correlated experience.

The second objection presupposes the misunderstanding underlying the first. For to hold Kant's definition of objectivity to imply that representations or experiences may at the same time be related by sequence as subjective, and by coexistence as objective, is to suppose that for him the 'objective' consists in experiences which are at the same time mysteriously something

else; which is precisely what Kant would be denying were he maintaining the view ascribed to him by Prichard. Were he indeed defining the objective in terms of correlated experiences, he would have to say that what is ordinarily regarded as the assertion of objective sequence, or coexistence, is to be distinguished from statements such as: 'Experience A is followed by experience B', not as having reference to anything but the subjective, but as giving, in a form of shorthand, a quantity of complex information about subjective correlations.

Even were Prichard's objections sound, however, they would, to my mind, be harmless to Kant since I do not believe him to hold the view they claim to assail.

It is true that, in the passage under discussion, Kant says 'appearance' 'is nothing but the sum of these representations' (i.e. experiences), but a moment's reflection should reveal that if he is regarded as writing something significant here he cannot be supposed to have intended this sentence literally. For assertions concerning 'appearance' such as those used by Kant e.g. his statements about ships and houses, cannot be regarded as referring only to actual experiences; nor can 'appearance' be described as 'an aggregate of possible and actual experiences' consistently with ordinary usage, since the term 'possible experience' is not commonly used as a name of an existent as are 'chair' and 'table'. To say that sentences containing the term 'appearance' refer to nothing (apart from words and their use) save actual and possible experiences (while using 'appearance'

as Kant does, and at the same time saying something significant), is to affirm only that (apart from anything they may assert concerning words) such sentences express merely statements either about actual experiences or about the possibility of experiences. It is thus clear that Kant's statement that 'appearance' is 'nothing but the sum of these representations', if not regarded as nonsensical, must be supposed the careless expression of oee of the two following assertions: a) that 'appearance', though distinct from individual experiences, is describable and conceivable only in terms of them; b) that statements about 'appearance' are simply assertions about either actual experiences or the possibility of experience. That Kant indeed intended to assert something other than the simple identification of 'appearance' with a sum of experiences is evidenced by his proceeding immediately to show how 'appearance in contradistinction to the representations of apprehension, can be represented as an object distinct from them'.(60)

Of the two assertions either of which Kant can be supposed to be making significantly, I think (a) must be regarded as that he intended. For not only is the defence of causality, to which this passage is introductory, clearly designed as a proof of necessary sequence in events as distinct from successions of particular experiences, but it also contains the insistence (61) that were there no sequence other than that of experiences, we should have no criterion for distinguishing 'objective' from 'subjective succession' as we do. This latter contention alone seems a clear enough rejection of the view that 'statements about the objective' are

simply assertions about actual and possible experiences.

But if (a) must be regarded as the most justifiable interpretation of Kant's words, he is affirming precisely that view of objectivity I have ascribed to him above. For only if 'appearance' means things (in themselves independent of our experiencing), as they appear to us, is it true to say both that 'appearance' is nothing apart from the sum of particular experiences, and that it is false to identify it either with such an aggregate or with truths concerning actual and possible experiences. Clearly an object, as it appears to us, is describable and conceivable only in terms of actual and possible experiences, (the latter being conceivable to us only in terms of elements in experience that are, or have been, actual). Yet at the same time, although it is possible to deny that experiences may be accounted for, wholly or partly, in terms of independent objects as they appear to us, it is a contradiction in terms to say that such an object as it appears to us is either simply an aggregate of experiences or a set of facts concerning actual and possible experience. But if one denies either the objective reference or the subjective nature of appearance, then one of the two assertions Kant must be supposed to be making is rejected.

Nor is this interpretation inconsistent with the assertions made in the rest of the passage.

For instance, if 'appearance' is so understood, and can properly be regarded as an existent's name; then it may, and indeed must, be said both to be given in or through particular experiences and

to be their object, as Kant describes it in this passage. For to call anything 'appearance', in this sense, is simply to say that we become acquainted with it by means of particular experiences, which latter may be said to be 'of' it as we are commonly said to have sight 'of' a hill or a house as something distinct from the experiencing with which we are brought in contact in the latter.

The final statements in the passage cannot be disposed of so briefly. Commentators have differed as to the 'rule' of which Kant here writes. Paton identifies it with the Analogies, (62) while Kemp Smith contends (63) that Kant does not make clear which of the two following senses of 'rule' he is meaning, namely: a) a general principle that all appearance must exemplify; and b) the regularities exhibited in appearances.

Both Paton and Kemp Smith seem to me mistaken concerning this passage in indicating that if Kant is referring to a general rule this is the Analogies, Kemp Smith indeed confining it to the Second. (64). This is surely unjustifiable. For as Kant thinks exemplification of all the schematised categories a necessary condition of the 'objective' with which he identifies 'appearance', if he speaks of the latter as being distinguished by exemplifying a general rule this can be no less than exemplification of all the schematised categories.

I think Kant <u>is</u> referring to the general principle, and this for two reasons. (a) The Transcendental Analytic, as a whole, is devoted to showing its exemplifying the categories to be a necessary condition of our recognising the objective as such.

(b) This interpretation explains his asserting 'the object is that in the appearance which contains the condition of this necessary rule'; since if we can recognise anything as an object only if it exemplifies the schematised categories, A's being an object for us, entails its exemplifying them within our experience. That Kant writes here of 'the object' as the condition of 'this necessary rule' indicates him to be referring to the 'rule' with which the previous statement is concerned.(65) He might well, therefore, have thought it needless to make explicit that he is writing of the general principle in both sentences; the more so since he asserts that the 'rule' exemplified in 'appearance' 'necessitates some one particular mode of connection of the manifold, thus clearly differentiating 'rule' in Kemp Smith's second sense from that which he so names here.

There is no inconsistency between the conception of 'appearance' I have ascribed to Kant, and the assertion that 'appearance' is distinguishable as such only if it exemplifies the categories - its objectivity thus entailing its exemplification of them.

When Kant writes that appearance is distinguishable from the subjective element in experience only if it exemplifies the categories, he may mean literally that exemplifying them is <u>one</u>, but possibly not the sole, condition of its being so distinguished. Or he may mean that this is the only necessary condition of that distinction.

Even if he intends to assert the latter, he can do so consistently with the conception of 'appearance' I have attributed to him. For since he asserts their application to objects to be demanded by our specific mode of experiencing, it is clearly of objectivity to us, i.e. being recognisable or conceivable as objective by us, that Kant asserts the schematised categories to be conditions. And its dependence on a thing in itself may be a condition of the objectivity of 'appearance' in the sense of its actual distinction from, and independence of, particular experiences, without precluding that objectivity's being recognisable, or conceivable, by us only through its exemplification of the categories.

If, however, Kant intends to assert exemplifying the schematised categories to be the sole condition of our recognising 'appearance' as objective, he is entitled to defend his postulation of the thing in itself only by showing it to be a necessary condition, not of our recognising objectivity, but of there being anything for us to recognise as objective given the appropriate conditions. This latter is more difficult to demonstrate than a condition of our recognising objectivity alone, and moreover would demand the 'dogmatic' type of proof which Kant distrusts.

There is certainly no contradiction in supposing exemplifying the schematised categories a condition of our recognising, as objective, 'appearance' in the sense I have supposed Kant to conceive it. It could, for instance, be consistently held that

we can properly conceive as objects of our experience only things (in themselves independent of our experiencing) appearing to us as though having specific characteristics exemplifying the schematised categories. And this I think most probably Kant's view.

Indeed Kant could claim to distinguish e xperiences as stimulated by things in themselves, only on the basis of some modicum of system or rule which these, as they appear to us, seem to exemplify. For since, by definition, the character of such appearance is wholly determined by our manner of experiencing, particular sense data (either singly or in groups) could not be said to be distinguishable as objective by any characteristic effect of the thing in itself stimulating them. Nor is there any reason why they should be intrinsically distinct owing to a characteristic manner of perceiving them (That there is in fact no intrinsic difference between our 'objective' sense date and what we call purely subjective experience has already been remarked). (66) Nor could experience of such 'appearance' be distinguished by its persistence, or its adequacy to that perceived. For though we may interpret objective experience in terms of things in themselves which, on account of our manner of experiencing, appear to us as though having the characteristics "commonsense" ascribes to phenomenal objects, yet we cannot claim direct experience of such appearances during much of the time when, on this view, we must suppose they exist (i.e. for as long as the thing in itself is 'there' to appear to us under appropriate

conditions). But if we could distinguish certain experiences as of things (in themselves independent of our experiencing) as they appear to us, only if they can be regarded as appearing to us as though exemplifying a certain rule or rules, then the possibility of interpreting experiences as so stimulated by things appearing to exemplify such rules, would enable us to distinguish them from the purely subjective. And it must be admitted that our objective experiences can be so interpreted.

Kemp Smith seems to suppose that when he uses the term 'object' at the end of the passage in question, Kant means to refer to the transcendental object in the sense of thing in itself. For he says that if by rule Kant means the specific regularities exhibited, the final sentence asserting the condition of the rule to lie in the object means 'that the prescribed order of the concrete events is due to the transcendental object'. (67) The preceding paragraphs will have shown that I disagree with Kemp Smith in this. Nor do I see how Kant can be supposed to be referring to anything but the phenomenal object by the term throughout the passage, since it is his avowed and obvious aim there to give an account of the 'objects' which we meet in experience. And since, further, in this final sentence he refers to the 'object' as 'that in the appearance', it seems plainly nonsensical to suppose this 'object' a thing in itself.

Kemp Smith seems to suppose that his interpretation of the passage amounts to treating it as a reformulation of the assertion in A110 that 'all appearances, in so far as through them objects

are to given to us, must stand under those a priori rules of synthetical unity whereby the interrelating of these appearances in empirical intuition is alone possible.' For he states Kant to be writing 'in terms of his earlier doctrine of the transcendental object,' continuing: 'To contrast an object with the representations through which we apprehend it is only possible if these representations stand under a rule which renders necessary their combination in some one particular way, and so distinguishes this one particular mode of representation as the only true mode from all others.' (68) If this is so he seems clearly mistaken. For A109 concludes with the explicit statement that the transcendental object is an unknowable x, while A110 itself states that <u>because</u> we can have no determinate intuition of the transcendental object, we can refer our experiences to it, or conceive them in terms of it, only if its appearance to us exemplifies a priori rules. And as he insists repeatedly that we can ascribe a priori rules to experience only if our manner of perceiving can be said to be such that that experience must exhibit them, (69) there seems no doubt that by this he means to assert that we can refer our experiences to a transcendental object only if our manner of perceiving is such that perception stimulated by such an object must exemplify certain rules rendering possible their interrelation. But this is quite the reverse of stating the transcendental object to entail specific phenomenal correlations directly. (it is of course possible to criticise the transcendental object terminology, and to suppose

Kant came to discard it as misleading, without either ascribing contradiction to the passages containing it or supposing Kant to have subsequently retracted them).

Presumably it is because he supposes Kant regards 'appearance' or phenomena as thus noumenally determined, that Kemp Smith affirms 'there can be no such middle term between subjective representations and the thing in itself'.(70) Otherwise his denial is inexplicable, since it is precisely the doctrine of the unknowable thing in itself which demands postulation of such an intermediary. For unless Kant can regard some particular experiences as explicable only as being stimulated by things in themselves which must appear to us as though having certain types of characteristic (this mode of appearing being determined by our manner of experiencing), he has no justification for postulating an unknowable thing in itself at all.

(B) The Proof.

As has been seen, (79) all Kant's proofs of the validity of the Second Analogy have the same aim: starting from the premise that we distinguish sequences as objective and subjective he claims to show this to be possible only because objective events always occur in necessary succession.

The first proof in the first edition, (71) the most familiar part of the discussion, may be divided into three sections. Of these, the first argues that experiences constituting perception of objective succession, always occur in an irreversible order,

and that they are thus distinguished from those we regard as purely subjective. The second contends that they can be so distinguished only if the order of our experience is derived from that of the events perceived whenever we 'perceive objective sequence'. Finally Kant argues that the order of events can thus render necessary that of our perceptions of them, only if the succession of events is itself necessary.

The first of these sections (72) constitutes a discussion of 'perceiving an event'. An event, (as generally conceived) is essentially something existing at a given time, previous to which it was not. To perceive an event, so as to recognise it at such, is therefore to perceive its non-existence at one time followed by its existence at another. But, argues Kant, since we cannot perceive empty time, so neither can we perceive anything coming into existence after an empty time: I can, therefore, never perceive A so as to recognise it as an event, unless my perception of it is preceded by another experience. (73) But, says Kant, their successiveness does not enable us to distinguish experience as perceptions of events for, as he has already remarked in discussing objectivity, we may have successive perceptions of parts of a house which we regard as objectively coexistent. One distinctive feature, however, is discoverable in all perception of objective or event sequence, namely its exhibiting an irreversable order.

This section is bristling with difficulties which are the more serious since the rest of the proof depends on it.

In the first place Kant does not make his meaning sufficiently explicit. This is serious enough since on its interpretation depend both the passage's intended role in the argument, and its ability to fill this. But even more serious is its inability to justify the desired conclusion on any of the possible interpretations.

The words with which Kant opens the argument contending experience of objective sequence to be irreversible: 'I also note, in an appearance which contains a heppening' (74) suggest that he is simply reporting what he has observed in experiences of objective sequence. Yet he proceeds to state that (a) perception of objective sequence 'can be apprehended in one order only; and (b) 'it is impossible' for their order to be other than it is. And he concludes with the assertion: 'in the perception of an event there is always a rule that makes the order in which the perceptions (in the apprehension of this appearance) follow upon one another, a necessary order'. (75)

Kant might therefore be taken to mean either: (a) examination of experiences of objective sequence reveals these to be always distinguishable by their irreversible order; (b) the possibility of like experience presupposes its exhibiting such an order; (c) we are prepared to apply the title 'perception of objective sequence' to those experience series only, which we can suppose irreversible; or, (d) we can conceive experiences as constituting perception of objective sequence only if we can suppose their order irreversible.

Were the passage given the first or third of these interpretations, Kant could not justly suppose it capable of leading to the type of conclusion he thinks it instrumental in proving.

Were he regarding it as merely a generalisation from experience he could not justly think it asserting a necessary conclusion, since later in his discussion of the analogy he makes explicit his conviction that necessity is not empirically discoverable. (76) But not only does much of the passage (including its closing sentence, quoted above) indicate that Kant supposed himself there to be maintaining a necessary conclusion, but it can fulfil the role intended for it in the proof only if so regarded. For clearly one cannot conclude that there must be a necessary succession of events because we have experiences which derive from such a sequence, unless he holds those experiences must derive from such a sequence. And similarly with the conclusion that our manner of conceiving certain experiences presupposes our regarding them as so derived.

Again, were he supposing it an assertion about how we are prepared to apply the title 'perception of objective sequence', he could justly regard it as stating no more than the use of that term and the character of anything to which we may consistently apply it. Yet he clearly supposes himself vindicating an assertion about all experiences of a given type: and it has been seen that if the passage is to play the role he intends for it, he must, moreover, be vindicating one which ascribes necessity to existents.

I think, therefore, that this, together with the wording of most of the passage, indicates that Kant gave it either the second or fourth of the three interpretations listed above. (That he was not claiming to infer objectivity from irreversibility has, I think, been made sufficiently clear by Kemp Smith, Ewing, and Paton). (77)

The second of the possible interpretations cited, though rendering the passage capable of leading to the type of conclusion Kant is trying to prove, cannot enable it to fulfil the role he intended. For its irreversibility can justly be held a presupposition of experience of objective sequence - in any sense other than that of simple conventional definition - only if that experience is distinct from the series of events of which it is called the perception, and the order of the former is derived from that of the latter. Thus, if A and B are other than, and independent of, my acts of perceiving, and A is followed by B; then if I can truly be said to observe that succession my perception of A must be followed, and cannot be preceded, by my perception of B. But if an experience sequence has no such relation to any independent series, then, even though it be in fact irreversible, I have ground for supposing it must be. And Kant does not defend this premise until the second step of the proof, to which he supposes the first to lead. He cannot, therefore, assume it in the latter without invalidating the argument as a whole.

In the later proofs, as will be seen, Kant argues explicitly, that we must conceive perceptions as exhibiting an irreversible order if we are to regard them as constituting experience of

objective sequence. (The objection that this is no more than an analysis of the way we are prepared to use the term, will be answered below in discussing the later proofs). This is the line of argument most adequate to proving the type of conclusion Kant claims to be demonstrating; for the categories, whose application to experience he is trying to prove, are, for him, essentially ways in which we must conceive objects of knowledge. This, together with the inadequacy of the argument given any of the other possible interpretations, and the fact that given the fourth of the interpretations instanced above, the argument of the first proof is brought into line with that of the later ones, strongly support the view that the fourth interpretation is that intended by Kant.

On the other hand, while the wording of most of the passage suggests the second interpretation; the fourth, though possible, is nowhere definitely suggested. And, indeed, if as Kemp Smith suggests, this is the earliest of Kant's proofs of the Second Analogy, their chronological order corresponding in general to a development in his thought, (78) it is not improbable that it should represent an inadequate line of argument later discarded - as it were an experimental effort to reach the desired goal - which helped to suggest a more fruitful line of approach. I hesitate, therefore, to say with certainty whether Kant intended the second or fourth interpretation.

In addition to the problem of interpretation, the passage provokes several difficulties, which are the more unfortunate in that they are irrelevant to its central argument.

The most serious of these is the reiteration of Kant's contention that experience is always successive (79) (understood in the sense of merely successive, since he treats it as a denial that we experience coexistence). Ewing has criticised this view very fully, (80) pointing out its inconsistency with both the results of introspection and the possibility of perceiving spatial relations (a possibility undeniably fulfilled). As Ewing and Paton remark, (81) this mistaken notion is quite irrelevant to Kant's argument. All he needs to show in contending that irreversibility, and not succession, is the criterion by which we distinguish experience of objective sequence, is that objective sequence and coexistence are not asserted on the ground of sequence and coexistence, respectively, in our perceptions. And indeed, this latter is all that Kant's sole defence of his view (namely our postulating successive perceptions of the objectively coexistent) can prove.

On the other hand, while in attributing mere succession to our experience Kant is, in this respect, postulating more than his argument requires, in another respect he is asserting less than this. And similarly, he actually proves less than he should. For his argument treats irreversibility as the sole distinguishing mark of perception of objective sequence. But he says absolutely nothing to disprove the assertion that perception of objective sequence is distinguished by irreversibility together with something else (other than succession which is presupposed in irreversibility). Doubtless he supposed this needless because he regarded this assertion as obviously false, but he should at least have stated

this much in justifying his position.

As has been seen, Kant proceeds - in the second step of this proof - to argue that the irreversibility he holds presupposed in experience of objective sequence, is capable of being asserted with certainty only if its order is derived from that of objective events.

I have already instanced this paragraph as apparently treating 'the series of events perceived' as distinct from 'our perceptions of them' (82). And later, (83), in discussing the first section of this proof, I argued that unless this distinction is maintained, the derivation of the order of perceptions from that of events perceived being asserted in terms of it, the irreversibility of of the former cannot justly be held necessarily true. And certainly, given the ordinary use of 'derive', one cannot talk of 'deriving the order of A from that of B' unless A and B are distinct. If A and B are merely different names for the same thing then, if one adopts the common usage, one must say rather that the orders of A and B are identical.

It might be argued that in order to speak legitimately (according to ordinary usage) of deriving the order of perceptions from that of their objects, it is necessary to distinguish these only as act and content of perception without reference to anything but the experience involved. I do not think so. For if the object of a perception is nothing apart from its content, then it would seem clearly contradictory to speak of deriving the order of perceiving from that of its objects; since insofar as these are distinguishable, on this view, the latter could not be said to have an order

separable from that of the former.

Kant must, therefore, I think (as I indicated above), be regarded as arguing here that 'experience of objective sequence' is distinguishable, only because its order derives from that of another independent of it. And since he denies that experience can inform us of the nature of things as they are in themselves independently of our experiencing them, he can only suppose this independent order to be that in which things in themselves must impinge on any human experience under given circumstances, the manner and order of that impingement being determined by the character of human experiencing. In other words, in my view, detailed consideration of this paragraph but confirms the opinion, expressed above, that it presupposes the conception of objectivity I have ascribed to Kant.

The above interpretation is supported, as has been indicated, (84) by the statement, appearing later in the second section, that 'subjective succession..... does not by itself prove anything as to the manner in which the manifold is connected in the object'. (85) For according to ordinary usage, to deny that the order of A indicates that of B, is to imply a distinction between A and B. An original usage is indeed possible making 'the manner in which the manifold is connected in the object' synonymous with 'an irreversible experience series', a usage according to which the sentence quoted asserts that AB's irreversibility cannot be inferred from the mere fact of its being an experience series. But it is reasonable to suppose that if Kant intended so uncommon an

usage he would have been at pains to make this clear. Instead he never suggests it.

To suppose that he did intend such an usage is indeed to ascribe to him an indefensible position. The preceding pages should have revealed that if objective sequence is merely irreversible experience series, we have no basis for discovering an experience sequence's irreversibility. To deny perception's irreversibility to be inferrible from its successiveness can then justify only an admission of ignorance, not a positive conviction such as belief in universal causation, as Kant supposes.

As has been indicated above, (86) I think the argument of the second section sound, but that as Kant offers no independent ground for holding that experience of objective sequence either must be, or must be conceived, irreversible, he has not adequately justified the role ascribed to it in the proof.

The third and last section of the proof consists, as has been seen, in inferring from the necessary succession of perceptions of objective sequence (regarded as established in the first stage), that of the events whence the second stage argued the order of those perceptions to be derived. This final step is, to my mind both justifiable and important, only if the view of objectivity I have attributed to Kant is adopted. For it is difficult to see how ab's derivation from AB can be regarded as justifying ascription of necessity to the latter, unless either ab is such that it cannot but derive from a necessary succession AB or else we cannot conceive ab, as such, unless we can regard it as derived from such a necessary

succession. As has been seen, on this view of objectivity, to say that experiences can ~~only~~ be irreversible and hence constitute what we ordinarily call perception of objective sequence only if their order derives from that of events, is to say that to be such the order of experiences must derive from that in which our perceptions stimulated by things in themselves must occur in virtue of our manner of perceiving.

Ewing, (not with reference to this proof in particular) endeavours to defend the leap from irreversible experiences to irreversible events on a realist view).

He argues that if naive realism were true and sense data parts of objects independent of the percipient, one could not ascribe irreversibility to experience without also attributing it to that in such objects of which one thought it the perception (87)

If, on the other hand, he continues, a realist representative theory of perception is true, then this means that when an event occurs a percipient must have experiences stimulated by it (if certain conditions are fulfilled), while one can experience an event only if there is in fact an event independent of his experiencing which produces it. But, argues Ewing, on this view if the perception of A entails that of B (A and B being objective events) than A must entail B; for then A (under given conditions) entails the perception of A, this in turn entailing perception of B which itself entails B. (88).

Neither of these arguments could justify a realist in inferring the necessary sequence of events from that of perceptions. For, as Ewing's account implies, the realist supposes the perception of B never follows that of A unless B follows A. And if perception of B necessarily follows that of A only when A is followed by B, the perception of A may occur without being followed by that of B should A occur without being followed by B, Nor would this be altered by the identification of object and content of experience. For instance, the fact that the sounds I hear were themselves events independent of my hearing them would not preclude my experience necessarily containing them in a certain order simply because this was the order in which they entered it, though they did not do so necessarily. It would be analogous with the passage of a number of billiard balls in succession over the same piece of table: given that they are travelling in a certain order they must necessarily pass over any part of that piece in that order, whether their travelling thus at all is itself necessary or not.

Even were the realist entitled to use Ewing's argument it would not entitle him to assert that one event is always necessarily followed by another, but only that this is so under the conditions given which its perception is possible (these including the existence of a percipient in a position to have such a perception). Nor can Ewing's specifying these conditions in formulating his proof alter this.

Paton supposes the last step of Kant's argument defensible only if a succession of events is identified with the experience of such a series. Thus he writes: 'Kant appears to be arguing that since the event A and the Event B are, on critical principles, only the content of sense perceptions a and b, the attribution of necessary succession to a and b (on the ground of the objectivity of the succession AB) is ipso facto an attribution of necessary succession to A and B; and the necessary succession is in both cases identified with succession in accordance with a rule'. (89).

But if AB is identical with ab, then to say B must follow A because b must follow a, if not mere tautology, is simply to make explicit a claim to two alternative methods of saying the same thing, together with the assertion that any adequate description of a series must affrim the same relations between its members.

Moreover, both in the sentence quoted and a little earlier, (90) Paton affirms that for Kant the perception of B must follow that of A in virtue of the succession of B on A, and it has already been seen that if one knows only that b necessarily follows a because B follows A, then one cannot infer the necessary succession of B on A from that of b on a.

To sum up, four points emerge from examination of the first first edition proof of the Second Analogy.

(a) Kant does not make the nature of its first step clear. I think he must be supposed to be contending either that perception of objective sequence is essentially irreversible, or else that we

cannot conceive experiences as perceptions of objective events unless we can suppose the former irreversible. And, though I hesitate to say with certainty which of these interpretations Kant intended, I think he could maintain only the latter consistently.

(b) Whatever his interpretation of the first step, he offers no justification of it - giving no indication as to whether it can be proved independently of the second, and thus leaving this and the third unsupported.

(c) The second step taken by itself is sound, though as has been seen it cannot play the role Kant intended for it because the first has not been shown to be independently defensible.

(d) The last step - namely inferring the necessary succession of events from that of perceptions - is justifiable only if the conception of objectivity I have attributed to Kant is so.

Thus the proof as a whole can be shown to justify its conclusion only if the two following conditions are fulfilled: (1) that the essential irreversibility of experience of objective sequence (or rather our manner of conceiving it as such) can be shown to be demonstrable independently of the deriviation of the order of such perceptions from events; and that (2) the conception of objectivity I have attributed to Kant be shown to be adequate.

Schopenhauer has criticised this proof on the ground that 'the subjective sequences' it considers are no less objective that 'the objective sequences' from which they are distinguished. For, he argues, not only is the order of our perceptions of the coexistent determined as much as that of our experience of the

successive, but the former like the latter is determined by the motion of a body - the only difference being that in perceiving the co-existent it is the percipient (or part of him) that moves.(91)

Against this criticism Ewing urges this latter difference to be precisely that on which Kant's distinction rests, maintaining him to be saying we ascribe the order of our perceptions to an object when, and because, we suppose them determined by this. Thus, he argues we do not suppose 'the order in which we perdeive the different parts of a house' objective as we do not suppose it determined by that house, though were we 'observing not the house but our own movements, then we should ~~then~~ assign objectivity to the latter - but in either case objectivity implies a necessary succession in our perceptions of what we call the object'. (92)

Kemp Smith argues (93) that Kant invites Schopenhauer's charge insofar as he describes the distinction he is drawing simply as that between 'subjective' and 'objective' respectively, thus suggesting that he is contrasting the objective with the purely subjective. For 'if inner and outer experience are to be contrasted as two kinds of experience, there is, as Schopenhauer rightly insists, no sufficient ground for regarding changes due to movements of the eye as being subjective and those that are due to movements of a ship as being objective'. But he contends that though Kant thus invites this criticism it is ineffective against him save as showing the inadequacy of his terminology, since he cannot be supposed intending to regard perception of the coexistent as purely subjective. This supposition is unnecessary for the

purpose of the argument where the distinction between subjective and objective sequence is used only to make clear the fairly obvious fact that while in certain cases the order of our perceptions is subjectively initiated, in other cases we apprehend the subjective order of our experiences as corresponding to, and explicable only through, the objective sequence of events.' (94) Moreover Kant's 'Critical principles definitely commit him to the view that even sensations and desires are integral parts of the unitary system of 'natural law'. (95)

Kemp Smith is clearly justified in denying that Kant can be supposed to be asserting perception of the coexistent to be purely subjective. This indeed is patent from the fact that he is avowedly distinguishing perception of objective sequence from that of objective coexistence, and is further indicated by the ensuing discussion - in vindicating the third analogy - of the conditions of postulating objective coexistence.

And it is equally true that Kant, in common with most people, regards experience of objective sequence as distinguishable from that of the coexistent in that the former's order is derived from that of the events of which it is the perception. But this alone does not suffice to defend Kant against Schopenhauer. For, as has been seen, the whole proof falls to the ground unless irreversibility can be regarded a criterion of perception of objective sequence independently of the latter's derivation from the events perceived. To answer Schopenhauer, therefore, it is necessary to show Kant to be right in ascribing irreversibility to perception of

objective sequence in a sense in which it is not ascribable to perception of coexistence, irrespective of the source of the order of the perceptions concerned.

This I think possible, whether Kant's argument as a whole be regarded as justifiable or not. For whereas whenever we say we perceive a sequence of events we think the order of our perceptions must correspond to the order of events of which we suppose them the experience, we suppose we can observe the coexistent in a variety of different orders. It may be true that in any given instance we must perceive the latter in a given order if we move our eyes in a certain direction, but the crucial point is that on another occasion if we move our eyes differently we shall see them in a different order, and we should cease to say we were perceiving the coexistent if this prophecy was unfulfilled; whereas we agree that no movement on our part can affect the order in which we observe events, if we perceive them at all, that the most it can do is to prevent our perceiving them. And that this distinction must hold, or at least must be conceived thus, for us to differentiate objective and subjective sequence as we do, is just the point which Kant is making in the first section of his proof.

It might be objected that on the view of objectivity I have attributed to Kant, the second step of the proof is unjustified, on the ground that it is impossible to conceive objective sequence other than in terms of ordered perceptions if the latter's order is not supposed determined by anything independent of the percipient. This seems to be suggested by Kemp Smith's view that Kant's position

is 'subjectivist' except on rare occasions when he went so far in the opposite direction as to regard the order of perceptions as determined by things in themselves. But this is not so. For, clearly, if I am so constituted that things in themselves must appear to me as though composed of, or exhibiting, events having a determinate order; then the order of my perceptions, though not determined by anything independent of me, is yet determined in virtue of their relation to such, and thus distinguishes them from a set of perceptions which either just happen to have a given order or are determined to a certain order in virtue of their relation to the percipient alone.

(b) The Remaining Proofs.

The second first edition proof (96) reverses the process of the first. While the latter argues from our distinguishing objective and subjective sequence, to the necessary succession of events; the former, starting from the hypothesis that there is no necessary succession of events, argues that were this so it would be impossible for us to distinguish objective sequence.

That we do in fact make this distinction is assumed in the second proof, and this I think supports Paton's contention that, whatever the date of the various proofs, in their final combination they are meant to form a continuous argument. For if the second proof were simply an independent addition flung into a group of distinct proofs, it is reasonable to suppose that having argued that were there no necessary succession of events we could not distinguish

objective from subjective sequence, Kant would have proceeded to urge that we do in fact make this distinctionand therefore the denial of a necessary succession of events is false. The omission of this last step indicates that the second proof, like the remainder of the first, is intended to follow, and rest on, the first step of the latter - the second proof being as it were a rider to the first.

If this is so, it also explains and justifies Kant's using the terms 'event' and 'object' in the second proof without any attempt to make their meaning clear, and his framing the whole proof in terms which leave its meaning doubtful if it is taken by itself. For if the second proof is meant as a rider to the first, then clearly the definition of objectivity preceding this is intended to do service for both.

Nor, assuming both to be adequate, is the second simply superfluous to the first. For since if our distinguishing objective from subjective sequence entails the necessary succession of events absence of the latter entails that of the former, demonstrating the latter entailment helps to support assertion of the former. The second proof is thus a useful confirmation of the first, if both are adequate. Indeed it is natural, polemically, to offer such confirmation.

If the second proof is interpreted in terms of the view of objectivity I have attributed to Kant, its argument runs as follows: If there is no necessary succession of events then we are aware only of the succession in which our perceptions occur, and can never

say the objects of our perceptions have any order in their own right, so to speak, since there would be nothing in the way things appear to us to determine our perceiving them in a certain order.

Again the argument seems inexplicable and unjustifiable unless Kant holds the view of objectivity I have attributed to him. For if we can perceive things as they are in themselves, and that the events we observe occur in their histories, then (as has been seen) the fact that we were perceiving them, in the sense involving recognition of this fact (evidently the sense of 'perceive' intended by Kant), would be sufficient to enable us to ascribe order to the objects of our perception. If on the other hand, as I have supposed Kant to mean, the only possible objects of our perception are things, not as they are in themselves, but as they appear to us; then unless our manner of perceiving determines the order of perceptions stimulated by things in themselves, we have no ground for distinguishing these from perceptions ordered subjectively.

Kant's writing in this proof that only if events necessarily succeed each other can we 'determine objectively which perceptions are those that really precede and which are those that follow' (97) might seem to suggest that he is here identifying events with actual perceptions. But this interpretation is hard to reconcile with the sentence immediately succeeding: 'We should then have only a play of representations, relating to no object; that is to say it would not be possible through our perception to distinguish one appearance from another as regards relations of time.'. It would certainly seem unreasonable to write of 'referring perceptions to

an object' if there were no object distinct from them. And although it might be contended that 'appearance is here a synonym of 'perception', if this were so it would seem contradictory to speak of distinguishing 'one appearance from one another as regards relations of time' in any sense not applicable to perceptions solely as mental states. Identification of events with actual perceptions is equally inconsistent with the statement, later in the proof, that if 'we experience that something happens, we in so doing always presuppose that something precedes it, on which it follows according to a rule. Otherwise I should not say of the object that it follows. For mere succession in my apprehension, if there be no rule determining the succession in relation to something that precedes, does not justify me in assuming any succession in the object'. (98) In the first sentence the 'it' which we suppose preceded by something on which it follows necessarily, is clearly the 'something' happening which we experience; and since our experience always has a beginning, and Kant can hardly be supposed to be asserting anything so widely at variance with the facts as that his every perception of an event must have been preceded by another, the succession referred to cannot be composed of actual perceptions. If it were, Kant's assertion would imply that we never experience an event, which is certainly not his intention. For the same reason the 'something' that precedes', in relation to which the objective perception succession is said to be determined in the third sentence, cannot itself be an actual perception.

And if it be urged that Kant, while not identifying events with perceptions, is treating assertions concerning events merely as statements about the possibility and actual occurrence of perceptions, then the language of this passage can no longer be adduced as most readily suggesting one's view. For clearly the phrase 'perceptions that really precede' no more naturally suggests a complex assertion concerning the possibility and occurrence of perceptions than it does the phrase 'objects of perception having an order independent of that of actual perceptions'. And, indeed, since the term 'perception' is sometimes loosely applied to an object of perception regarded as distinct from the perceiving, and 'real' is often intended to distinguish what is so regarded from that having no existence apart from particular experiences, it suggests the latter phrase far more readily than it does the former.

The view that the first and second first edition proofs are to be taken together as complementary, is supported by their being followed (99) by general remarks vindicating Kant's method of proof and making explicit his claim to reconcile (a) the postulation of causation in the sense of necessary connection; (b) the empiricist assertion that we derive all significant conceptions from experience; and (c) the Humean denial of the possibility of observing necessary connections. These remarks open by noting the apparent inconsistency of Kant's proofs with the common view that we derive the concept of causality inductively. This is followed by a reiteration of Hume's contention that this method could never justly lead to the conception of necessity integral

to the common notion of cause. We must, Kant avers, put necessity into experience before we can discover it there. But, he adds, this does not mean we could formulate the concept of causality adequately independently of experience.

The two latter assertions may at first sight seem contradictory; on the view of objectivity I have attributed to Kant, however, not only are they mutually reconcilable, but the first cannot be true unless the second is. For if the 'putting into experience' is extrinsic to experience as we know it, being the human reaction to stimulation by things in themselves, transforming them (as it were) in the act of impinging; our consciousness of what we thus automatically contribute to experience can be discovered only by analysing experience itself (not merely with regard to its content as in induction, but in respect of its basic character and presuppositions).

Consideration of the demand for an empirical defence of causality naturally suggests to Kant the attempt to offer empirical support for his position, his avowed intention in the third proof (100) which follows immediately. Continuity is thus still preserved. Moreover, if my account of the first two proofs is correct, and the avowed intention of the third sincere, Kant certainly did not intend the latter as a restatement of either of the former which I supposed him to base, not merely on the results of observation, but on the presuppositions of our experience of objective sequence. Naturally, since he is intending to offer empirical confirmation of conclusions he has

previously argued deductively, he again discusses our criterian of objectivity in general, before proceeding to examine our postulation of objective sequence in particular.

Just as in the first step of the first proof, where he must be supposed to be examining the logical presuppositions of experience, Kant confuses the issue by using language suggesting psychological generalisation; so now, when his argument is avowedly empirical, he introduces deductive grounds for its conclusions. (There is, of course, no inconsistency in introducing deduction into an inductive argument to clarify the implications of a generalisation, so as to be able to test it more adequately, though it is hardly precise to apply the term induction to such a process as a whole - but this is not what Kant is doing here). Thus he argues 'Objective meaning cannot consists in the relation' (of a representation) 'to another representation (of that which we desire to entitle object), for in that case the question again arises, how this latter representation goes out beyond itself, acquiring objective meaning in addition to the subjective meaning', (101) He repeats the argument that objective succession cannot be inferred from subjective since all experience is successive, and argues that to recognise X as an event is to recognise its having a definite position in time, that latter being possible only if an event follows necessarily on something.(102).

Yet it would be unjust to say that, having explicitly stated the intention of offering empirical confirmation of his conclusions, Kant proceeded to frame purely deductive arguments. For more than once in the course of this proof he writes as though attesting empirical fact. For instance, in discussing the criterion of objectivity in general, having dismissed with a deductive argument the view that this lies in the relation of one representation to another, he proceeds to ask 'what new character relation to an object confers upon our representations.....' and concludes that we find.....that only insofar as our representations are necessitated in a certain order as regards their time relations do they acquire objective meaning'. (103) And again he asserts as though merely stating observed fact 'the manifold of representations is always successive'; and 'immediately I perceive or assume that in this succession there is a relation to the preceding state, from which the representation follows in conformity with a rule, I represent something as an event..... that is to say I apprehend an object to which I must ascribe a certain determinate position in time - a position which in view of the proceeding state cannot be otherwise assigned'. (104) This latter statement is immediately followed by the deductive argument, mentioned above, that it must be true; but there is no indication that its truth is regarded as resting solely on this, rather does the manner of its statement suggest the reverse. I think, therefore, the introduction of deductive arguments into this proof is most probably due to a misguided zeal which

prevented Kant from being content merely to state what he judged to be empirical evidence without seeking to confirm it deductively in its turn, regardless of the fact that this confirmation was not only irrelevant to, but obscured the whole point of, this proof.

Paton (105) thinks the third proof adds nothing to is predecessors; and the view that it is no more than a restatement of what has gone before is shared by Kemp Smith, (106) though the latter regards it as improving on some of this, describing its final paragraph as 'a much clearer statement' of the argument of A192-3=B238-9.

It has been seen that the proof was not intended so. Nor do I think its deductive accretions can be so regarded. It is true that both its concluding paragraph and the previous proofs argue, in effect, that perception of an existent having an objective temporal position presupposes universal causality among events; but Kant reaches this conclusion by two different methods in the course of his discussion. In the first proof he has been seen to argue that in distinguishing experiences as perceptions of events we recognise them to be irreversible, which latter presupposes the universal causation of events. But in the third proof he argues directly (107) that for us to recognise something as having temporal position is to recognise its following necessarily on another. And since the closing paragraph of the third proof urges explicitly that we can recognise a's having a definite temporal position, only by recognising it to be preceded by something on which it follows necessarily, (108) it would seem more correct

to regard this as a prestatement of what is to come rather than a restatement of that which precedes.

The third proof cannot be regarded as an independent vindication of the analogy. Insofar as it consists in attesting empirical evidence it can confer only probability whereas Kant thinks the analogy's validity certain. And, as has been seen, the passage preceding this proof makes it clear that Kant himself does not suppose empirical evidence alone capable of vindicating the Analogy. Nor can the deductive addition be regarded as an independent proof, as the premise on which it rests — that 'only by reference to what precedes does the appearance acquire its time relation' - is not defended as it is in the succeeding proof. This seems to confirm the view that, in its present form, this proof was intended solely as part of the larger discussion constituting the whole section on the analogy. And that its place in that section is not fortuitous seems suggested by its closing lines' reading like a précis of the succeeding proof, thus giving it the appearance introducing this.

The fourth first edition proof (109) is generally regarded as completely different from the others. The above remarks will have shown that I do not share this view.

Ewing argues (110) that though it differs from them, in contending that all events must have temporal position it implies the irreversibility of our perceptions of them which forms the basis of the other proofs. (I have just pointed out that it does not form the basis of the third whose argument, insofar as it is

deductive, is more akin to that of the fourth in its method).

Paton suggests (in a footnote) (111) that the fourth proof might possibly be regarded as an elaboration of the view 'that the passage of appearance in time is always in one direction', which is implicit in A194=B239 and A199=B244. This latter view is, indeed, implicit in the whole section, as it is in Kant's treatment of time in general; and clearly if all the proofs are consistent with his conception of time, experience, and objectivity, they must have much in common - particularly as they are designed to defend the same conclusion. But this does not prevent any one of them taking a different course from its fellows. Indeed, I have but now noted an important difference between the first and fourth proofs. And there is a yet more important distinction between them. The first takes for granted our perception of events as something undeniably given in experience, and is content merely to consider the distinctive character of such perception and its presuppositions. The fourth, on the other hand, opens with a deductive argument designed to prove that we must experience events. Certainly this in its turn rests on the analysis of experience and its presuppositions (i.e. on the given); but it does take the argument a step further back, revealing Kant's view of the relation of perceiving events to the general character of experience. This latter is a very important point which is neither made explicit nor even suggested in the first proof.

In the Transcendental Aesthetic Kant had already contended that time is an essential condition of phenomena by which he evidently meant that things can appear to us only as though occurring in an absolute time composed of continuously successive times. 'For neither coexistence nor succession would come within our perception (as, he assumes, they evidently do) if the representation of time were not presupposed as underlying them a priori. Only on the presupposition of time can we represent to ourselves a number of things as existing at one and the same time (simultaneously) or at different times (successively).

Time is a necessary representation that underlies all intuitions. We cannot, in respect of appearances in general, remove time itself, though we can quite well think time as void of appearances.' (112) He opens the fourth first edition proof of the analogy by arguing (113) that since all appearance must exist in such a time, this must be composed of a succession of events analogous to the succession of times.

Ewing (114) criticises the fourth proof on the ground that it consists in inferring the causal determination of an event by a predecessor from the analogy of events with successive times, which latter, he points out, could not serve to prove universal causation among events for the simple reason that the relation of one time to its successor is not that which Kant ascribes to cause and effect. There are, he points out, two senses in which a time can be said to determine its successor: (a) as that standing in an assymetrical relation to it, and thus delimiting the relation in

which that successor can and must stand to it; and (b) in helping to characterise that successor in respect of its temporal relations. Neither of these senses of 'determine' is analagous with that in which a 'cause' as such is said to 'determine' its 'effect', for a 'cause' does not merely precede its 'effect' but is an event of a kind which must be followed by one of another given type under specific conditions. He further supports his denial of identity between 'causal' and temporal determination by pointing out that so far as time relations alone are concerned the future may be said to 'determine' the past in exactly the same way as the past may be said to 'determine' the future, whereas an 'effect' cannot be said to 'determine' its 'cause' in the sense in which a 'cause', as such, 'determines' its 'effect'.

Ewing's criticism is sound if his interpretation of the argument is correct. For Kant normally treats 'causation' as necessarily regular succession, and it is in this sense that he is intending to prove its universality among events. Nor, indeed, have 'causation' and 'succession' ever been regarded as synonyms either by plain men or philosophers. And Ewing's additional argument should have equal force for Kant, who does not suppose 'cause' and 'effect' determine each other in the same sense (115) as Russell has suggested (116) they may be said to do.

But I do not think Kant intends the fourth proof to treat 'causal' and temporal succession as analogous. Rather do I think him to be arguing: (a) since appearance must exist in time it

must consist in events in temporal succession, as are different times: and (b) we can recognise an event as existing thus at a given time, only if we can recognise it as being preceded by something on which it follows necessarily (For Kant, to speak of an appearance as having a given temporal position is synonymous with saying we can recognise it as having one, since appearance is essentially how things seem to us).

Certainly the first paragfaph argues that because appearance must represent the time series, earlier appearances must determine later ones as times do their successors, an event being possible only because preceded by another on which it follows necessarily. But this need not be taken to imply the identification of causal and temporal determination, since on my interpretation it is still legitimate to state the universal causation of events as a consequence of the analogy between events and times. That he is intending thus to state it as a consequence of that analogy, without suggesting causation to be itself analogous with succession, is indicated by his explicitly distinguishing the ascription of universal causality to events from the assertion that the earlier determine the later as earlier times determine their successors; 'it is also an indispensable law of empirical representation of the time series that the appearances of past time determine all existences in the succeeding time, and that these latter, as events, can take place only in so far as the appearances of past time determine their existence in time, that is determine them according to a rule'. (117) Had he been intending argue on the

basis of an analogy between 'causation' and succession, he would surely have introduced the final contention that there is therefore universal causation among events with a 'that is to say', 'in other words', or some similar phrase, rather than a conjunction effectively differentiating it from what has gone before.

Similarly when Kant writes in the second paragraph (118) that the understanding carries the time order into appearances, assigning to each as a consequent 'through relation to the preceding appearances, a position determined a priori in time', he cannot be supposed to be identifying causal and temporal determination; for he proceeds immediately to argue that since 'this determination of position' cannot be established by comparing events with absolute time, it must be discovered from the 'causal' determination of each event by an antecedent.

Although I do not think the fourth proof so blatantly open to objection as does Ewing, I still think it incapable of justifying its conclusion. For, like the first and second, it supposes 'causality' a necessary condition where it is not. The first proof has been seen to rest on the, to my mind, mistaken view that only if there is universal causation of events can we distinguish perception sequences, as we do, as irreversible and hence objective. In the fourth he assumes that, failing the possibility of comparison with absolute time, an event's causal determination by an antecedent ~~to be~~ is our only criterion for defining it, as we must, as temporally placed. Yet clearly temporal position is definable in terms of temporal relations

to other existents, if sufficient of these are known; and since temporal and causal relations are not identical, this means there is no need to introduce causation for the purpose. It might perhaps be thought that, at this stage of his argument, Kant is assuming the conclusions of the first two proofs, his present assertion that recognition of temporal position presupposes the universal causation of events being intended to rest on these. If this were so it would not save his argument, since these proofs have been seen incapable of justifying their conclusions. But Kant's language indicates that it is not so; were he discussing, not a criterion for defining temporal position, but the condition of a certain manner of perceiving, the possibility of impossibility of comparison with absolute time would be irrelevant.

The paragraph A200-1 = B245-6 in Kemp Smith's translation is apparently meant as a bridge between the fourth and fifth proofs. It opens by stating the results of the two stages of the fourth proof from the point of view of experience, and not its object. 'That something happens is, therefore, a perception which belongs to possible experience. This experience becomes actual when I regard the appearance as determined in its position in time, and therefore as an object that can always be found in the connection of perceptions in accordance with a rule'. (119) And the assertion that causality is thus a condition of all objective knowledge of succession, in its turn, reads as introductory to the fifth proof which proceeds 'The proof of this principle rests on the following considerations'. (120) As Paton remarks (121) the wording of B246=A201 is unfortunate in that 'the

principle of sufficient reason' is used as a synonym for 'causation', since Kant certainly does not think 'causation' analogous with 'sufficient reason' as this latter is defined by Leibniz and generally used by subsequent philosophers. Presumably Kant thought himself entitled to use the term because he had left no doubt that he supposed 'causation' (in his sense of the term) the only type of explanation discoverable among phenomena.

The fifth proof,(122) like the first two, rests on the distinction between objective and subjective sequence. It is briefer than the first, and lays more emphasis on the connection Kant asserts between the irreversibility of objective perceptions, and their ~~being~~ ~~of~~ being 'of' causally determined events; whereas the first tends rather to obscure this by being broken up into sections. On the other hand, the fifth proof is less explicit as to the distinction between perceptions and events perceived.

Again Kant, this time in defining an event, fails to make explicit whether he is simply giving an account of common usage, stating an empirical fact, or affriming an intrinsic presupposition of our experiencing an event. The latter interpretation is that required to justify his argument, and, I think, (on the ground of his general attitude) that which he most probably intends.

The language of this proof (~~122~~) is unfortunate in that it asserts 'All empirical knowledge involves the synthesis of the manifold by the imagination'(123) which suggests experience to

be produced by a conscious process, which is clearly a contradiction in terms.

This suggestion is again conveyed in the proof added in the second edition, (124) which describes 'connection' as 'the product of a synthetic faculty of imagination'. This proof appears to do little more than summarise the conclusions of the first, second, and fifth, in the first edition: to conceive an objective sequence it is necessary to regard successive states as occurring in a necessary order; they can be conceived so only in terms of a pure concept, namely that of causation. The distinctive role of this proof seems to lie in its prefacing the detailed discussion with a concise statement of Kant's position.

(c) General Remarks - Summary.

It has been seen (125) that Kant failed to justify his inferring the necessary succession of events from the irreversibility of our perceptions of them. And it has further been observed that only definite temporal correlation, and not causation, is required for the definition of temporal position. On the other hand, I do not think Kant open to the criticism levelled at him by Prichard, that he is positing a conscious process to consciousness of objective sequence, although his language sometimes suggests this. His treatment of experience in general seems to make it clear that the conditions which he enumerates are, to him, presuppositions implicit in it, and not the objects of

some self-contradictory conscious pre-consciousness. That he is not postulating a process to awareness of objectivity, in particular, seems sufficiently attested by his treating such awareness as basic to all experience, the proof of this being no less than the aim of the Transcendental Deduction.

Further though I do not think his arguments substantiate their conclusions, nor am I aware of any which could show causality (in Kant's sense especially) a necessary presupposition of experience; I see no prima facie objection to such a proof. For Kant seems justified in supposing that universal 'causality' among phenomenal, in the sense of experienceable, events would be vindicated could it be shown a condition of our experiencing any such. Where his arguments fail is in their attempt to show it to be such a condition.

iv. Substance and Reciprocity.

As Ewing remarks, (126) no discussion of Kant's treatment of causality is complete without some reference to the first and third analogies, the principles of permanence in substance and of coexistence through reciprocity.

The main proof of the first analogy in both editions resembles the fourth first edition proof of the second in that they rest on our inability to perceive time, arguing that because of this the analogy's exemplification in experience is presupposed by our recognition of temporal relations. With regard to substance or permanence (which Kant treats as analogous), neither succession nor coexistence can be perceived save in relation to the permanent; and since time itself cannot be perceived, the permanent in relation to which they may be perceived must lie in the appearance which exists in time. Paton remarks (127) that it 'would be very peculiar' if substance as conceived by Kant could not be perceived since it is introduced to supply the permanence we cannot perceive in time itself'. I do not think this follows, however. Kant is explicit that a category is a manner, not of perceiving, but of conceiving; so there seems no objection to supposing him to be arguing that because we cannot recognise temporal relations by relating them to time, our doing so is possible only because we conceive experience in terms of a permanent existent. (This latter, of course, entails that things in themselves must appear to us so that the perceptions they stimulate can be conceived as deriving from, or being 'of', a permanent existent).

Kant's 'substance' differs from the continuants postulated by commonsense in that he regards it as indestructible. Furthermore, it must be one and not many, since he maintains (128) that no coming into existence can be perceived unless conceived as an alteration in something persisting through the change; which, if true of all change, can only mean that there is a single substance underlying it. That this, was Kant's meaning is indicated by his explicitly identifying substance with matter in the second edition, (129) evidently regarding matter as homogeneous in its basic element, apparently regarding light (130) and the ether postulated by his predecessors and contemporaries (131) as forms, or specially rarefied arrangements, of it.

In postulating the indestructivility of substance Kant's picture of the phenomenal universe is akin to that of Aristotle who has been seen to hold that while its basic elements are transformed one into the other, none is ever completely destroyed so that nothing that was in it remained. And Kant's view that we must conceive all phenomenal change as occurring in a persistent substratum is reminiscent of the Aristotelian contention that 'matter' is a presupposition of all 'causation' and hence of all change.

Prichard maintains (132) that having treated the first analogy as though it were presupposed by the other two, Kant appears to forget this, proceeding to offer independent vindications of the latter. This view seems unjustified, however, since to say that

we can conceive neither objective sequence nor objective coexistence save in terms of permanent substance, is not to deny that additional and distinct conditions are required for the recognition of each so that our distinguishing either may be regarded as arguing an additional presupposition of experience.

Prichard also contends (133) that despite his protestations to the contrary, Kant's vindication of the first analogy is 'dogmatic' in that it argues from the nature of change and not from the possibility of experiencing it. This seems clearly unjustified. The second edition addition to the main proof argues that 'all change or coexistence must, in being apprehended, be perceived in this substratum, (i.e. substance) and through relation of the appearances to it.' ~~(134)~~ And although the main first edition proof contains assertions like 'Without the permanent there is therefore no time relation', which taken in isolation suggest Kant to be speaking of change rather than the conditions of our perceiving it; that this is not his intention is clear, both from his repeatedly making it explicit in this passage that he is referring to 'appearances' (e.g. in describing permanence as 'the abiding correlate of all existence of appearances' (134)) and from his conviction that time is merely a condition of our experiencing so that in discussing temporal attributes he must be considering the manner in which we experience. While in his argument from alteration alone (135) (which paradoxically is that quoted by Prichard to substantiate his contention), Kant contends that because we cannot perceive empty time we can recognise coming into existence only by regarding it as a change in an

existent persisting throughout it.

Kant has been criticised (136) for basing his vindication of the first analogy on our experience of temporal, rather than spatial, relations, since the substance he is postulating is clearly regarded as spatial and, indeed, he explicitly denies a non-spatial permanent in the world of appearance - regarding the phenomenal self as a mere series of isolated perceptions. And Kant himself seems to have felt at one time that space should have played a part in the proof. This reaction is natural when the first analogy is considered in isolation from the other two, especially when taken in relation to the rest of the Kritik. But Kant clearly regards it as basic to the other two, which latter he treats, and defends, as presuppositions of our recognising temporal relations. The introduction of space in vindicating the first would thus at best have needlessly complicated his argument, at worst destroying its continuity. Moreover, it is the temporal element in substance, namely its permanance, with which Kant is primarily concerned.

I have already made it clear (137) that I do not think persistence attributable to the spatial alone, pointing out that consciousness of temporal sequence argues persistence in that which is aware of such sequence. And indeed Kant's defence of the unity of apperception (138) serves to establish the same conclusion. Kant, however, could not have used such an argument to vindicate the first analogy, nor have applied the category of substance to the percipient so regarded, since this, latter, for him, is not a possible object of experience but merely a presupposition of experience whose existence can only be inferred.

The main vindication of the third analogy is complementary to Kant's favourite method of defending the second. Our recognising perceptions as experience of objective coexistence presupposes our regarding them as reversible. We are not justified in so regarding them, however, unless their reversibility can be supposed necessitated by the objects themselves; and this is to attribute interaction to those objects.

It is not clear whether Kant regards this interaction as consisting merely in the reversibility of my perceptions of A and B being determined by the mutual positions of A and B, the movement of my eyes, and the action of light; or whether he is arguing a more direct interaction between A and B, such as the fire affecting the nearby ice in Prichard's illustration. (139) The former interpretation seems the juater, however, for two reasons. (a) It is made explicit in A 213-4=B260-1; and (b) it would render the argument comparable to the vindication of the second analogy which is clearly not meant to argue (as Schopenhauer mistakenly supposed) that if AB is an objective sequence A is the cause of B.

Paton contends (140) that, as in vindicating the second analogy (on his interpretation) Kant is arguing from a necessity in our perceptions to one in objects identified with them. He apparently supposes Kant's vindication of the third analogy to consist in arguing that our recognising perceptions as of the coexistent, and therefore as reversible, presupposes their being states of, and hence determined by, coexistent objects. But this is not to regard it as analogous to the defence of the second

analogy which Paton attributes to Kant: namely the argument that since perceptions of successive events must occur in necessary succession, and since these are identified with the events they are said to be 'of', these latter occur in necessary succession. To be analogous with this the vindication of the third analogy should argue that, since perceptions are identified with their objects, to assert the former to be necessarily reversible is to assert that their objects necessarily exist alternately; which is neither Kant's argument, nor that attributed to him by Paton. And, clearly, the argument I have attributed to Kant - namely that in order to regard perceptions as 'of' the coexistent we must be able to regard their reversibility as determined by a network of causal connections involving those coexistents - does not require the identification of perception and its object, and is in fact assumed by the realist holding a representative theory of perception.

Kant's treatment of the third analogy has been criticised (141) as confusing coexistence and interaction between objects with coexistence and interaction between their states. And Schopenhauer has argued (142) both that the third analogy is superfluous in that it asserts nothing beyond causality, and that it is self-contradictory in asserting reciprocity since this is saying that A may be both 'cause' and 'effect' of B - which is to say that it may both precede and follow B.

The first and third of these criticism depend on the interpretation of the third analogy which I have rejected. It

becomes important to distinguish objects and their states in defining the analogy, only if it posits the direct interaction postulated between adjacent fire and ice. If the determination involved is merely the complex ordinarily assumed by eighteenth century science as integral to perception of the coexistent, it may be convenient sometimes to refer to (phenomenal) objects (as in Kant's example of the earth and moon) and sometimes to their states (as in considering the coexistence of heat and cold in two basins of water). Again, if my interpretation is adopted there is no need to suppose Kant to be regarding the coexistent as 'cause' and 'effect' of each other, but merely as factors in a complex of 'causal' connections. Kant, however, would not have been disturbed by Schopenhauer's criticism since, although defining 'causation' in terms of succession, he admitted the possibility of simultaneity between 'cause' and 'effect', allowing that their sequence may be merely logical in the sense that given the 'cause' the 'effect' occurs while the converse does not hold.(143). He could therefore have regarded one element in A as 'causing' another in B, while yet another in B 'caused' a further factor in A. He could not of course have regarded A as both 'cause' and 'effect' in the same respect, but this would not necessarily be involved even in asserting interaction between coexistent events.

Nor does it seem just, on either interpretation, to regard the third analogy as superfluous because the necessity it asserts is basically 'causal'. For the assertion that every event has a 'cause' is distinct from both the statement that no two objects

(or states) can coexist without interacting directly, and the contention that the coexistent can be perceived to be such only in virtue of a complex of 'causal' connections linking them with the percipient in a certain manner.

Ewing has pointed out (144) that if experience is not held to be purely successive, objectively determined coexistence in perceptions could be regarded a condition of experiencing objective coexistence (as, indeed, it generally is).

v. Conclusion.

To sum up. Kant supposes we perceive, or at least can claim to perceive, no more than things, not as they are in themselves, but as they must appear to us. This, he maintains, justifies us in making assertions which are necessarily true about the objects of our experience, since we can say that these must conform to any condition demanded to enable anything to be an object for us. The principles of substance, causality, and reciprocity are defended in this manner. We in fact distinguish ~~the~~ coexistence and succession. This distinction can be derived neither from our perceptions taken by themselves, nor by reference to absolute time. It must rest therefore on our supposing certain experiences to be 'of' things appearing to, or impinging on, us as though successive or coexistent respectively. We can so conceive perceptions only if we suppose them stimulated by something impinging on us as though there were a single eternal substratum underlying all the changes and differences perceived in or conceivable on the basis of experiences so stimulated. We can conceive perceptions as 'of' the successive only if we suppose that stimulating them to impinge on us as though exhibiting a series of events which is not only irreversible, but exemplifies certain rules of invariable sequence, the position of each event being determined by such a rule. And we can regard them as 'of' the coexistent only by supposing them stimulated by something appearing to us as though consisting in coexistent events, objects or their states, so related to each other and to ourselves both

spatially, and in terms of laws of invariable sequence, that under given conditions we must experience them alternately. We can, therefore, say with certainty that the world with which experience presents us must appear to us as though constituted of changes and differences in a single eternal substratum; as though it contains irriversible event series analysable in terms of invariable sequences, either logical or actual; and as though containing coexistent states or dispositions of the basic substance, our experience of which is determined as reversible in virtue of a complex of invariable, or causal, sequences.

The most obvious objection to this view is raised by the complexity of the conditions postulated as required for the recognition of objective temporal relations. We do, certainly, at an early age, regard experience of objective sequence and coexistence respectively, as determined, in a very simple manner by that in objects we suppose ourselves to be experiencing in conjunction with our relation to it. The child supposes that he sees the train first at A and then at B because: (a) he looks in a given direction; and (b) the train is really first at A and then at B to be seen there. And he further supposes that if two bricks are side by side, and he turns his head first one way and then another, he will see them first in one order and then in another. But it seems highly improbable that he clearly formulates this distinction early enough to be said to recognise objective sequence and coexistence only in terms of it. He certainly recognises

objective coexistence long before he is capable of postulating the complex causal situation which, on any theory of vision, is a condition of recognising coexistence given the view I have attributed to Kant. To this he would doubtless have replied that he was discussing the conditions of recognising temporal relations intelligently, that the infant may have some instinctive mechanism for making the appropriate distinctions but could never come to 'understand' them, as he normally does, unless things appeared to him in such a way that they could be supposed to determine his perceptions in virtue of their temporal relations.

It has been seen (145) that with regard to 'causality', an objective sequence need not itself be supposed necessary in order to be consistently regarded as rendering the succession of our perceptions so.

The relation of the permanent to change was discussed in earlier chapters, (146) where it was seen; (a) that perception of temporal sequence presupposes a percipient persisting throughout that perception; and (b) that changes supposed external to the percipient need be attributed to a continuant persisting throughout them, only if it is held that nothing is inexplicable and that they would be inexplicable unless so conceived. In neither instance was the perception of change seen to presuppose the postulation of a continuant which was either eternal or the single basic substratum of all change.

Its failure to recognise that, under certain conditions, subjective coexistence is regarded as representing objective

coexistence certainly constitutes a serious objection to Kant's treatment of the third analogy. In its positive doctrine, however, (if my interpretation of this is correct) his discussion of this analogy has been seen to be far less open to criticism than that of the others. Since to assert any perception to be objectively stimulated and conditioned, even within the world of appearances which for Kant constitutes the phenomenal, is to suppose it determined by a network of 'causal' connections. Kant might, indeed, be criticised for introducing postulation of such a 'causal' complex as a condition of recognising reciprocity alone, since perception of objective sequence must be similarly conditioned. Kant's failure to mention this, however, need not amount to its denial, as it might be due merely to a desire to concentrate on the presupposition of such perception considered most important. Indeed, Kant nowhere claims to have enumerated all the conditions of perceiving objective temporal relations - the explicit aim of the vindication of the second analogy being, not an exhaustive analysis of perceiving objective sequence, but a proof of universal causality among events. In fact the only conclusion about causation to be derived from considering experience of the objective, as something distinct from the percipient, is that to assert such perception is to postulate some causal connections and is thus inconsistent with the denial that any such connection can justly be asserted.

It has been seen (147) that although Kant does not suceed in vindicating universal 'causality', he is correct in supposing that every object of human experience must conform to any condition

required for constituting such an object.

It was further seen (148) that, whatever its merits in its own right, the Kantian interpretation of experience cannot justify its claim to answer Hume on his own ground (i.e. while accepting his premise that necessity is not discoverable in experience). For it was seen that Kant's conclusion is only justifiable if he supposes our experience necessarily conforms to certain conditions; and this contention, if it is more than a definition - as Kant should (and evidently does) suppose it to be - must rest on experience. For an analysis of what would be involved in a certain type of experience can justify no conclusion concerning actual human experience unless examination reveals the latter to be of that type.

NOTES.

(1) Cf.Kemp Smith: A Commentary to Kant's Critique of Pure Reason (Macmillan 1930) pp.202, 211, 227, 233-4, 268-9.

(2) Kant's Metaphysic of Experience (Allen & Unwin 1936) Vol 1. p.41

(3) Cf.Kemp Smith: Commentary Pt.11. Ch.11

(4) Kant's Metaphysic of Experience Vol.1 pp.37-43

(5) Cf.Kemp Smith: Commentary pp.84, 120-2,136,350-1,358

(6) Kant's Metaphysic of Experience Vol.1.pp.49-56.

(7) For the opposite view cf. Kemp Smith: Commentary pp.xx-xxiii, 120-2, 136, 202-331, 350-1, 358.

(8) The following presupposes (in tenor and terminology) the discussion of non-verbal entail~~ment~~ above (Introduction Sect.ii)

(9) Supra Ch1V Sect.iv p.319.

(10) Ibid. pp.309-14.

(11) Ib. pp.319-21

(12) B23-4 (pp57-8); A10=B14 (p51); A77-8=B103 (pp.111-2) Kemp Smith's transaltion of the Kritik of Pure Reason (Macmillan 1933) is referred to and quoted throughout).

(13) B24 (p58)

(14) Supra Ch.1V Sect.iv pp.319-21)

(15) B.33 (p65); B72 (p90); A27 (p.72) B148(p163); B150(p.164)

(16) A185=B228 (p215); for a similar use of the term 'dogmatic' cf. also B23 (p57)

(17) A26=B42-A30=B45 (pp71-4); A47-9 (pp.85-7); B64-73 (pp.85-91); A129-30 (pp.149-50) B164 (pp172-3)

(18) B5 (pp.44-5)

(19) A23-49 (pp.67-87); B37-73 (pp.67-91)

(20) B33. (p65); B72 (p.90); B148 (p.163); B150 (p.164);B72 (p.90)

(21) A77=102-A81=B107 (pp.111-4); A111 (p.138); A119 (p.143); A125-30 (pp.146-50) B143 (p.160); B146 (p.161), A88 = B120(pp.122-3)

(22) A137=B176-A142=B181 (pp.180-3) B146 (pp.161-2); A77=B102(p.111) A90=B123(p.124); A95-6(pp.129-30)

(23) A139=B178-A147=B187 (pp.181-7)

(24) A143=B183-A144=B184(pp.184-5 A177-218; B219-265 (pp.208-38)

(25) A323=B380 (p.316); A508=B536-A565=B593 (pp.449-483); For a résumé of Kant's general view of the ideas of reason as regulative principles cf. A508=B536-A510=B538 (pp.449-51)

(26) Cf.A Commentary to Kant's Critique of Pure Reason. pp.xlv-vii; 83-4; 120-2; 136-8; 227; 272-84; 312ff; 349-51; 357-8; 373-4; 414-7; 617ff.

(27) A26=B42-A30=B45 (pp.71-4); A47-9(pp.85-7); B64-73 (pp.85-91); A129 (p.149);B164 (pp.172-3)

(28) Cf.A190=B236-A193=B238 (pp.220-1)

(29) A80=B106(p113);A144=B183 (p185);

(30) A77=B102(p111); A90=B123 (p124); A95(p129);A139=B178 (p181); A119(p143);B147-9 (pp162-4); B166(pp.173-4); A155=B194-A156=B195(pp.192-3)

(31) A80=B106(p113);A143=B182(p.184)

(32) B233-4(pp.218-9);

(33) A201-2=B246-7(pp.226-7);

(34) A190=B235(p.220);

(35) A193=B238(pp221-2);

(36) A194-5=B239-40(pp.222-3);

(37) A200=B245(226)

(38) Commentary p.374.

(39) Ibid.

(40) Commentary p.372

(41) Ibid.pp.120-2

(42) Supra pp.468, 478

(43) I am, perforce, criticising Kemp Smith's commentary on the basis of a translation only; but as this translation is hiw own, I feel justified in doing so.

(44) Commentary p.314.

(45) Ibid p.373

(46) Kant's Treatment of Causality (Kegan Paul, Trench & Trubner 1924) Ch.lV p.98.

(47) Ibid. p97

(48) A537=B565-A558=B586(pp.466-79)

(49) A194=B239(p.222)

(50) Supra pp.480-1

(51) A158-235(pp.194-252); B197-294 (pp.194-256)

(52) Cf.Commentary pp.356-8

(53) Cf.Kemp Smith: Commentary pp.363-4, 371-7; Ewing; Kant's Treatment of Causality Ch.lV p.73; Prichard: Kant's Theory of Knowledge (Clarendon Press: 1909) Ch.XII p.276.

(54) Cf.Kemp Smith: Commentary p.363

(55) Cf.Kant's Metaphysic of Experience Vol.ll Ch.XLlll p.225.

(56) A190=B235-A191=B236 (pp.219-20)

(57) Supra p.478

(58) Cf.Kemp Smith: Commentary pp.368-9, 371-3; Paton: Kant's Metaphysic of Experience pp.230-8; (for a marked difference of opinion cf.Kemp Smith pp.372-3 and Paton pp.236-7) Ewing; Kant's Treatment of Causality Ch.lV pp.76-7; Prichard: Kant's Theory of Knowledge (pp280-4)

(59) Kant's Theory of Knowledge Ch.Xll pp.280-2

(60). A191=B236 (p.220)

(61) A193=B238(pp.221-2)

(62) Kant's Metaphysic of Experience Vol 11 Ch. XL111pp.235-6

(63) Commentary pp.372-3

(64) Ibid.pp.371-2

(65) A191=B236(p.220)

(66) Supra Ch.6 Sect.ii p.350.

(67 Commentary p.372

(68) Ibid.pp.368-9

(69) Cf.A33(p76); A26=B42-A30= B45(pp.71-4); A89-95 (pp.123-7); B122-9 (pp.123-8); A96-130 (pp129-50);B130-69 (pp.151-75);

(70) Commentary p.373

(71) A191=B236-A194=B239 (pp.220-2)

(72) A191=B236-A193=B238 (pp220-2)

(73) This, surely, must mean that we cannot conceive an event not preceded by another, since presumably we have all had a first perception i.e. one that for us was preceded by no other.

(74) A192=B237 (p.221)

(75) A193=B238 (p.221)

(76) A196=B241 (p.223)

(77) Cf.Kemp Smith's Commentary pp.365ff. Kant's Treatment of Causality pp53-9, 76-82, 85-6; Kant's Metaphysic of Experience pp.239-40

(78) Cf.Commentary p.371 where the argument is said to be stated 'in terms of Kant's early doctrine of the transcendental object'.

(79) A190=B235(pp219-20); A192=B237 (p.221)

(80) Kant's Treatment of Causality Ch.lV pp.82-5

(81) Kant's Treatment of Causality Ch.lV p83; Kant's Metaphysic of Experience ~~(82)~~ Vol.11 p.231

(82) Supra p483

(83) Supra p.516

(84) Supra p.483

(85) A193=B238 (pp.221-2)

(86) p.516

(87) Kant's Treatment of Causality Ch.lV pp91-2.

(88) Ibid pp.92-3.

(89) Kant's Metaphysic of Experience Vol.2 Ch.XL111 pp.242-3

(90) p.242

(91) Werke (Frauenstadt 1873) i.p.85ff

(92) Kant's Treatment of Causality Ch.lV.p.87

(93) Commentary p.366.

(94) Ibid. pp366-7

(95) Ib. p.367

(96) A194=B239-A195=B240(pp.222-3)

(97) A194=B239 (p222)

(98) A195=B240 (p223)

(99). A195-6=B240-1(pp.223-4)

(100). A196-9=B241-4(pp.224-5)

(101) A197=B242(p224)

(102) A198=B243(pp.224-5)

(103) A197=B243(p.224)

(104) A198=B243(pp.224-5)

(105) Kant's Metaphysic of Experience Vol.11 CH.XL1V p.252

(106) Commentary pp.374-5

(107) A199-201=B244-6 (pp.225-6)

(108) A198-9=B243-4(p.225)

(109) A199-201=B244-6 (pp.225-6)

(110) Kant's Treatment of Causality Ch.1V pp.75-6

(111) Kant's Metaphysic of Experience, Vol.2 Ch.XL1V p.253

(112) B46,A31 (pp.74-5)

(113) A199=B244 (p.225)

(114) Kant's Treatment of Causality Ch.1V pp.74-5

(115) A194=B239(p.222)

(116) Cf. On the Notion of Cause: Mysticism and Logic p195

(117) A199=B244 (p.225)

(118) A199=B245 (p.226)

(119) A200=B245 (p.226)

(120) A201=B246 (p.226)

(121) Kant'sMetaphysic of Experience Vol.11 Ch.XL1V p.255 footnote 6

(122) A201-2=B246-7(pp.226-7)

(123) A201=B246 (p.226)

(124) B233-4(pp.218-9)

(125) Supra pp.516,521,525

(126) Kant's Treatment of Causality Ch.V p104

(127) Kant's Metaphysic of Experience Ch.XL11 p.204

(128) A188=B231 (p.217)

(129) B225 (pp.212-3)

(130) Cf.A213=B260 (p.235)

(131) Not only is it prima facie probable that Kant shared his contemporaries' belief in the existence of the ether, but his doing so is evidenced by his denying the coexistence of bodies surrounded by empty space to be perceptible to us (A212=B239), and by his asserting 'We cannot empirically change our position, and perceive the change, unless matter in in all parts of space makes perception of our position possible to us. (A213=B260)

(132) Kant's Theory of Knowledge Ch.X11 pp.275-6.

(133) Ibid.pp.274-5 A187=B230 'The correct understanding of the concept of alteration .....' ff. seems to be stating, not that permanence is intrinsic to the nature of change independently of our experiencing (as Prichard suggests?), but that we can regard, or think of, a change only in terms of a permanent underlying it.

(134) A183=B226 (p.214)

(135) A187-8=B230-1(pp.216-7)

(136) Cf.Kemp Smith Commentary pp.360-1; Paton: Kant's Metaphysic of Experience CH.XLll pp.199-201.

(137) Ch. 1 Sect. i. b. p.89

(138) A99-104 (pp.131-4); B131-40 (pp.152-8)

(139) Kant's Theory of Knowledge Ch.Xll p.303-4

(140) Kant's Metaphysic of Experience Vol.ll Ch.XLVl pp.305-9

(141) Cf.Prichard: Kant's Theory of Knowledge Ch Xll p.306

(142) The World as Will and Idea: Werke. ii pp.544ff

(143) A202-3=B247-9 (pp228-9)

(144) Kant's Treatment of Causality Ch. V p.118

(145) Supra pp.521-3

(146) Ch.1.Sect. i p.89; Ch.2. Sect.iii d. pp.203-7

(147) p.547

(148) Ch. 4 Sect. iv pp.520-1

CHAPTER Vlll

SOME CAUSAL PROBLEMS RAISED IN THE PRESENT CENTURY.

(i) INTRODUCTION.

From Kant to the twentieth century may seem rather a wide leap (though it is considerably less than that from Aristotle to St.Thomas which was made above). It appears justified, however since, apart from Bradley's discussion of the problems of continuity and the possibility of isolating causal systems within the universe (both of which are sufficiently relevant to the present chapter to merit some mention here), the nineteenth century seems to have made no original contribution to the discussion of 'causation'. Mill, it is true, in formulating his inductive methods, made explicit the regular correlation he supposed postulated by causal law - a useful and necessary service which helped to make discussion of the subject more precise. But Mill did not penetrate deeply into the problems raised by the postulation of 'causal' law, and indeed maintained a confidence in 'universal causality' completely inconsistent with his empiricist principles. Nor did he even seem aware of any serious difficulty in their reconciliation.

As has been indicated (1) most modern British philosophers (2) continue the process, begun in the seventeenth century, of identifying 'causal' connection with the type of uniformity asserted (or thought to be asserted) by scientific law. Thus they regard an assertion of 'causal' connection between A and B as making or implying a statement of the form 'Whenever A then B', whose truth allows inference from the existence of A to that of B and justifies prediction either of B or of

something else. Thus they are committed to offering an analysis of such assertions which is both compatible with experience and self consistent.

Although there is wellnigh general agreement that 'causation' spells uniformity, there is less unanimity as to whether this is all which is to be asserted in postulating a 'causal' law. The major subdivision of opinion is between those who assert a 'causal' law to state a de facto universal correlation, and those supposing it to assert entailment of the 'effect' by its 'cause'. Within both schools of thought further subdivision is possible, but it seems to be found only within the second. As Russell has pointed out, (3), a de facto regular correlation, justifying the inference that B is probable given A, might quite well consist in A's generally being followed by B's (i.e. the truth of the law: 'Whenever A then a B will probably occur'). But, as he also observes, the definition of 'causal' law in these terms seems to be generally rejected although both physics and sociology admit laws asserting regularity of frequency alone. Those who regard a 'cause' as entailing its 'effect', on the other hand, may be divided into those who think all 'causation' analogous to voluntary behaviour in involving some conscious purpose, and those who do not. Activity in the 'cause' in the sense of its determining the change which is, or achieves, B seems clearly implied by any entailment view, but only because in this broad sense it asserts nothing but entailment. I think, however, that most of the philosophers who have described

'causes' as 'acting', 'operating' or 'producing', have in effect acdepted neither of these definitions, but rather one confining the title 'cause' to 'efficient causes' very much as these are conceived by Aristotle. For they evidently regard 'causation' as essentially a series of events in the history of one continuant, which also constitute a process of change in another whose culmination is properly to be called the 'effect'. In other words they assimilate 'causation' to action, not insofar as the latter is regarded as intelligent or purposeful, but insofar as it may be regarded as A altering B. Those who thus assimilate activity and 'causation' generally assume also an intrinsic connection between both the members of such event series and their conclusion, and between the character of the 'cause' continuant and the possibility of certain 'cause' events occurring in its history. They therefore suppose more than bare uniformity to be involved in causal connection; but they have often regarded voluntary action as involving a non-necessary factor. They have held, for instance, that a statue cannot exist in the absence of certain events, nor these in the absence of a volition, and that the occurrence of volition and events (if these latter are sufficiently precisely defined) entails the existence of a statue; but they have also held that the volition need not have occurred in the first instance, and that its revocation may or may not occur at any stage of the process inhibiting the latter. They have supposed other factors capable of inhibiting such a process, but the peculiar importance of their allowing the possibility of its

voluntary suspension lies in their supposing this to exhibit neither necessity nor uniformity. This conception of 'causation' thus differs in an important feature from that maintained by exponents of both the regularity and entailment view as these are understood today; it has been seen to be shared by plain men, Aristotle, St.Thomas (though these do not confine the title to agents so conceived) and Descartes; and Locke's definition of 'causation' in terms of production seems to have rested on the same view (to mention only the more famous names). As, has been seen, (4) however, in discussing Hume, a philosophers may use 'cause', 'operate', and 'produce', as synonyms without intending any of the above definitions.

Most modern protagonists of both the regularity and the entailment view seem to assume that either a connection is intrinsic or it is not necessary. This means, not only that upholders of the entailment view reject the essentially Kantian conception of 'causation', but that both they and their opponents ignore the fact that particular, and even specific, connections could be necessary in virtue of universal de facto regularities alone (e.g. that if the laws of dynamics hold universally, whether their doing so is intrinsically necessary or not, the behaviour of billiard balls on impact is entailed thereby).(5) This leads on the one hand to a denial of necessity too wholesale to be consistent with the facts, and on the other to an unwarranted assumption that pointing to these derivative necessities is sufficient to establish natural laws as basically or absolutely necessary in the sense defined above (6)

in discussing Leibniz. (But of this, more hereafter).

From the character of their discussions it is clear that those defining 'causation' in terms of regularity and entailment, respectively, are concerned not merely with a theoretical question as to the type of circumstance in which they would be prepared to use the term 'cause' should these ever occur, but are convinced that we have good ground for postulating actual connections to which one of these definitions is applicable while the other is not. Since in discussing 'causation' they are concerned with a type of connection they suppose justly attributable to existents, they are under the further necessity of defining the conditions given which this attribution is defensible, and of justifying this definition.

'Discussion of causation' in Britain during the present century has thus had three main themes: (a) analysis of the notion of universal correlations compatible with experience and capable of serving as a basis of inference (and especially of prediction); (b) their interpretation; (c) our grounds for postulating them.

ii. The Analysis of Regular Correlation.

(a) Complexity in Causal Laws.

Both in his early essay 'On the Notion of Cause', (7) and in his recent book on human knowledge, (8) Russell insists that no definition of 'causation' in terms of a correlation which is both simple and constant, is compatible with the usage of either plain men or scientists. Since most philosophers suppose that in discussing 'causal connection' their reflections are applicable to the 'causes' and 'effects' postulated by science and common sense, this point should be considered by those offering an analysis of 'causation'.

It was seen, in discussing Hume, (9) that no simple uniformities are discoverable among actual impressions or sense experiences. And, indeed, it seems clear that the majority of laws postulated by science and common sense cannot be regarded as asserting unconditionally uniform relations between two types of existent considered in relative isolation from their circumstances (even though those existents be defined in terms of continuants or objective events in the traditional sense of the term). Fire warms, but not when it is merely seen through a window; A's taking a generous quantity of arsenic will be followed by his death if, and only if, he does not promptly take an emetic; a body will move in a straight line, unless deflected from its path according to the laws of gravitation or impact; etc. Certainly there is no intrinsic impossibility in a correlation being both simple and constant, as there would be in a body being

both round and square simultaneously; moreover there are grounds for supposing some propositions of the form 'Whenever A then B' to express true statements about the physical world, when A and B are defined in relatively simple terms. Thus it seems reasonable to suppose that whenever a bullet enters a man's heart he stops breathing. But this appears to be so, only when A and B are both essential parts of the same complex and at least one of them inseparable from it. Thus a bullet entering A's heart is an essential element in the complex event which is A's dying in a certain manner, of which his ceasing to breathe is also part; and while his ceasing to breathe may enter into other types of complex, the bullet's entering his heart cannot be fully described save in terms of the complex which is his dying thus. It might therefore be maintained that no unqualified assertion of the form 'Whenever A then B' is true of the physical world unless it is tautologous, and that therefore no such statement can properly be regarded as expressing a physical law. (It should perhaps be remarked that though this type of objection would be raised by most contemporary philosophers, it would not be felt by all modern scientists, as the contention of E.A. Milne referred to above (10) bears witness).

Often, as in the above illustration, when such an unconditionally constant correlation seems to obtain, the occurrence of A will not serve as a basis for predicting that of B since they will either be simultaneous or have so short a time interval between them that it will be impossible to discover the occurrence of A before B has taken place. This alone, however, need not disqualify such a

connection for the title 'causal', if this is to be applied only to those which may form a basis of prediction, since knowledge of a constant correlation between simultaneous terms may allow me to predict, not only sense experiences, but also objective events. Thus if I know that a bullet's entry into a man's heart is constantly correlated with the simultaneous, or almost immediate, cessation of his breath, the sight of a bullet entering A's heart enables me to predict that if I place a mirror before his lips I shall see the latter remain clear; and it will also enable me to predict that if I fire at B's heart, and shoot straight, he will probably cease breathing. Of course I might faint or die before I could inspect the mirror after seeing A shot, and B's heart, like that of, the man in Broad's illustration, (11) might be protected against my bullet by a metal plate; but I may have reason to suppose this improbable, and for so regarding the possibility of the bullet's being deflected from its course before reaching its target. My prediction can thus have no more than a high degree of probability - but as this is all most modern philosophers are prepared to attribute to any causal inference, this need prove no disqualification for the title. Indeed, both science and common sense are prepared to describe postulated constant correlations between simultaneous factors as 'causal', and base predictions on them. One example, namely the correlation asserted between a metal's temperature and its expansion, has already been noted (12); others which come readily to mind are those asserted between the presence of iodine in an arganism and its development, and that

between absence of sunshine and the presence of rickets in animals living where there is little.

Nevertheless, even though one allow, not only that there would be no contradiction in supposing an unconditioned constant correlation might hold between relatively simple types, but that such relations actually occur and may justly be called 'causal'; since most of the 'causal' connections asserted by science and commonsense are not of this nature, the definition of 'causation' in these terms would remain illegitimate to any one intending his treatment of the term to be consistent with common usage. Indeed, even if a philosopher did not demand of his definitions consistency with common usage, he would be ill advised to decide to apply the title 'cause' to simple constant correlations alone. For he is unlikely to be in a position to be sure that any experienced correlation is completely unconditional, while he may have very strong grounds for supposing that it holds under certain conditions even though he may be uncertain as to whether he can specify all that are relevant. The restricted definition would thus increase the uncertainty in the postulation of 'causal' laws, so reducing the utility of postulating them. Furthermore the commonly accepted, and well attested, conditional regularities still remain to be fitted into his picture of the physical world.

(b) Continuity.

It has been seen (13) that the conception of 'cause' and 'effect' as contiguous (in Hume's sense of the term) is inconsistent

with the nature of the temporally and spatially extended. Any definition capable of applying to temporal or spatial existents must therefore treat 'cause' and 'effect' either as continuous or as separated by a finite interval. The former alternative is that usually adopted today, but the latter was accepted by Russell in his essay 'On the Notion of Cause'. (14) I shall examine each definition in turn, considering it first with reference to temporal relations and then with regard to spatial ones, since (as has been already suggested)(15) the situation is not quite analogous with respect to each.

It has been seen (16) that there is no intrinsic objection to the notion of a regular succession between events separated in time either by an interval or by other events. And it was further seen (17) both that the assumption of universal causation in terms of regular sequence involves the assumption of many such regular correlations between events separated one from another, and that both science and common sense assume many to obtain(as for example in the connection they postulate between the lighting of a fuse and the explosion of a bomb, connected to it). Russell has pointed out (18) that the existence of a time interval, no matter how small, between a postulated 'cause' and its 'effect' introduces an element of doubt into all our causal inference, since we can never be sure that something might occur in this interval which would prevent the accustomed sequence being fulfilled. However, we often have good ground for supposing it unlikely that an

accustomed sequence should be thus inhibited, and most modern philosophers think no 'causal' inference can yield more than a high degree of probability; there is, therefore, no reason why an exponent of the regularity view should not define causation as a sequence between events of different types separated by a time interval, which always occurs under certain conditions;— holding that we are often justified in prediction on the ground that we have good reason to expect one or more such sequences to occur.

On the other hand, it seems that those who regard a 'cause' as entailing its 'effect' cannot accept such a definition without qualification, since it appears impossible to regard the existence of A as entailing that of B if there is no temporal link between them. It certainly seems inconceivable that A's existence should entail that of B save in virtue of something continuous, or coexistent, with A and B, otherwise in what could the intrinsic link between them consist. It seems, therefore, that while anyone postulating an intrinsic connection between 'cause' and 'effect' is at liberty to apply the title to temporally separated events (as it is often convenient to do); he must make the proviso that these are always 'causally' related in virtue, either of something coexistent with both, or else of a process continuous with both.

If, however, a 'cause' is regarded as being such in virtue of a series of events in its history, of which the last is regarded either as being or achieving the completion of, the 'effect', then

clearly 'cause' and 'effect' are ipso facto regarded as linked by a continuous process.

Clearly there is no more intrinsic objection to the notion of regular correlation between spatially separated events than there is to that of temporally separated ones. Once more, such correlation is both implied by the postulation of 'universal causation' in terms of uniformity, and assumed by both science and commonsense. Of this, the common interpretation of gravitational phenomena is at once the most obvious and most hackneyed example. And, again, the assumption of science and commonsense is generally acknowledged to have so strong an inductive justification as to make its rejection unreasonable. (I refer here to the rudimentary principle involved, and not, of course, to the precise formulation of the law or to its interpretation).

And once again the question is less simple for those postulating any sort of intrinsic connection between 'cause' and 'effect'. It certainly seems as difficult to conceive intrinsic connection between the spatially separated as between factors separated in time, if this does not occur in virtue of something linking them. Certainly anyone supposing constant correlation between spatially distant objects to be entailed by any physical connection between them would seem to be implying a continuous spatial link. If, for instance, he says that one body tends towards another because it sees, hears, or smells it, or because affected by electricity or radioactivity in that other, he is

postulating a process linking those bodies in space.

It was seen above, (19) in discussing commonsense, that 'causal' connection is sometimes postulated between factors between which a spatial relation is deemed impossible. And, moreover, the commonsense view of psychological phenomena as non-spatial seems justified. Russell has maintained (20) that thoughts and other psychological phenomena are to be regarded as located in the experient's brain; but, as it seems clearly nonsensical to speak of a thought or feeling being to the right or left of another, this expedient does not serve to give these spatial position. For were Russell's view justified, it would be significant to say that my geometrical calculations were to the left of my right hand neighbour's auditory image of Beethoven's fifth symphony, and to the right of my left hand neighbour's visual image of Mont Blanc. But this cannot be so unless geometrical calculations, and auditory and visual images are the sort of things which can be conceived as standing in such relations one to another. It is significant to say that my nose is to the left of Brown's ears and to the right of Smith's teeth precisely because noses, ears and teeth can be seen to be capable of standing in such relations irrespective of their attribution to this or that person. That this is just what we cannot do with regard to psychological phenomena is attested both by our experience of these, and by Russell's need to appeal to something other than themselves in his attempt to give them spatial position.

If, therefore, these psychological factors are regarded either as 'causes' or 'effects', or as links in a chain connecting 'cause' with 'effect', then it must be admitted that not all 'causes' are linked to their 'effects' by spatial continuity. But then neither need it be maintained that some 'causes' are separated from their 'effects' by a space in which there is nothing helping to link them, since these distinctions do not apply at all to factors not describable in spatial terms. (Anyone postulating 'causes' or 'effects' to which, like the Kantian thing in itself, temporal relations are not applicable, is in a similar position in being unable to define 'causation' in terms of any temporal relation). It would, however, be legitimate to assert that while not all 'causes' and 'effects' are spatially (or temporally) related, those that are must, (or cannot, as the case may be), be linked with each other by a continuous process.

It remains to ask whether 'cause' and 'effect' could significantly be regarded as related by such a process.

Bradley maintained (21) it to be contradictory to postulate a continuous 'causal' process, on the ground that this amounted to regarding a 'cause', properly so called, as unextended and so non-existent. Broad has countered this argument by maintaining (a) that there is no reason to suppose that every state must persist for a finite time, and there are, indeed, grounds for denying this since it would involve rejecting the view that the first law of motion is immanent; (22); and (b) that even were this not so,

it would not exclude the possibility of continuous causality, since so long as there were enough states in the universe every moment could be the last of some given state so that the total condition of the universe was never the same at any two moments(23)

Both Bradley's argument and Broad's reply to it seem to assume the assertion of continuity between 'cause' and 'effect' to mean what Hume intended by the contiguity of 'cause' and 'effect'. For it is the essence of Hume's position that the temporal and spatial are composed of indivisible parts which, as such, must be unextended.(24) (Though Hume apparently failed to see this latter). Hence temporal and spatial continuity (as opposed to Humean contiquity), if they are to mean anything at all, surely entail that whatever has temporal duration or spatial extension respectively, no matter how small, is further divisible temporally or spatially as the case may be. Nor does a sprocess thus continuous seem incapable of constituting a 'causal' sequence consistently with either the regularity or entailment definition of 'causation'. Surely the demands of the regularity definition are met if it is true of a 'causal' process that, however much it is subdivided, no section will be found which does not exemplify a law of regular correlation. The demands of the entailment view, are more complex, but equally amenable. For there seems no contradiction in supposing the occurrence of the whole process AB to entail that of BC continuously with it, even though different sections of AB were not entailed by any antecedent; thus there seems no contradiction

involved in the commonsense assumption that the occurrence of a given series of events entails the existence of a statue in its completion although none of those events is in itself inevitable. On the other hand, if the occurrence of $\overline{AB}$ entails that of BC, this can only mean that the occurrence of any part of BC (under these circumstances at least) entails that of the remainder). The exponent of the entailment view could, therefore, postulate continuous 'causal' series, so long as he held that no subdivision of an entailed process is discoverable which is not entailed by a temporal or spatio-temporal predecessor. I think, however, that most exponents of the entailment view would hold this to be as true of the 'cause' process AB as of the 'effect' process BC, supposing this to be true of all processes.

Granted that exponents of both the regularity and entailment views could postulate continuous 'causal' series with self-consistency, it may still be asked whether they could do so consistently with the evidence. This can be discussed adequately only by one with a far better knowledge of modern science than I can claim; but I can hardly avoid venturing an opinion on the subject.

It might be thought that the discovery of unpredictability in electron jumps constituted positive evidence that many supposed 'causal' processes, and certainly all properly described as physical, cannot be analysed beyond a certain point without the discovery of elements exhibiting no regular correlations, and for the postulation of whose entailment there is hence no

adequate ground. This view, seems unjustified, since the analysis of phenomena in terms of quantum physics is irrelevant to the truth of statements concerning them regarded as macroscopic. And surely this must be so if quantum physics is to have any objective application, since its theories are capable of empirical confirmation only if the truth of certain assertions concerning macroscopic phenomena as such (e.g. measuring instruments) is assumed. Thus, if it is possible to describe the motion of a billiard ball in terms of the ball's quantum analysis, doing so will presumably consist in ascribing that motion to a system of quantum reactions, factors, or continuants (according to the interpretation of quantum physics adopted). And the unpredictability of reactions within that system is perfectly consistent with the movement of the whole being compatible with the laws of dynamics so that there is no section of its progress, however small, which does not exemplify these, and hence could be regarded as entailed by earlier events in virtue of them without blatant contradiction of the facts. The case would appear to be roughly analogous with that of a box of marbles carried in a certain direction; here it is obvious that the fact of individual marbles rolling about at random within the box is perfectly consistent with the whole group of them moving at the same time in one given direction, and hence as capable of exhibiting a uniformity of motion not ascribable to any one of its members in relation to the others.

Again, it might be argued that since it is impossible to ascribe both position and velocity to quantum phenomena, with precision, it is unjustifiable to regard a systemor group of quantum phenomena as exemplifying laws which presuppose its having a precise position and velocity at any given time while moving. If the principle of indeterminacy asserted the impossibility of quantum phenomena having a precise position and velocity simultaneously, this would indeed follow. But the impossibility asserted seems to lie, not in an electron's possessing a position and velocity simultaneously, but in our measuring both with precision simultaneously because the only possible method of measuring either alters the other. (The situation is explained very clearly by L.S.Stebbing (25) so there is no need to elaborate it here). And clearly it is significant to speak of altering A's position and velocity and of unavoidable error in computing them, only if A has a definite position and velocity to alter and about which to be mistaken. Furthermore, the fact that error in computing the one varies inversely with that incomputing the other, in neither case reaching zero, seems clearly to indicate that here is a definite velocity and position to be altered, more or less, by our measuring process. Moreover, quite apart from the peculiar difficulties of measuring anything so minute as quantum phenomena, it seems inevitable that sufficiently minute analysis of any continuous process will reveal a like imprecision.

Thus, for instance, however short the period in which I examine A, if A is moving continuously, it will be moving throughout that period and so will not have any one position to be observed. In large scale phenomena the period of observation may be sufficiently short for the movement to be so minute, relative to that moved, as to be unnoticeable; but if the analysis can be precise enough, it will become evident, and reveal one's computation of position and velocity to be no more than an approximation, however close. The position would be analogous to that postulated by the special theory of relativity, which regards neither spatial nor temporal distance as capable of precise computation, but only the result of their conjunction. Nor does this mean that one could not speak significantly of position and velocity in relation to continuous movement. For to speak of A moving through given positions, not only presupposes that the positions are there, but also that they are integral ~~bet~~ to the complete description of A's movement. Nor need any assertion of A's position be ambiguous. If its movement is continuous then it may without contradiction or ambiguity be said to be occupying p at time t, if this is understood as shorthand for an assertion of the form: 'A was between p1 and p2 during the period t1-t2'. If, however, Zeno's objection that a continuously moving body is never anywhere is still felt decisive, movement may (consistently with the evidence) be regarded as discontinuous unless any a priori ground for denying this is accepted.

For, as the cinema bears witness, A's appearing in closely related positions in rapid succession can give the illusion of continuous motion. That which moves could therefore be regarded as stopping at various positions, so long as the period of these stops was short enough to make them unnoticeable in either the external observation, or direct experience, of motion. Nor is the inevitable approximation in computing position and velocity in continuous motion inconsistent with the possibility of its exemplifying 'causality' in either the 'regularity or entailment sense of the term, or with the possibility of apparently precise computation, and consequent correct prediction, relative to macroscopic phenomena such as the behaviour of billiard balls and bullets. For there is no contradiction in supposing motion to exemplify regular or necessary correlations to which the distance occupied within a given duration is integral. Furthermore, in the smallest period in which we can observe macroscopic movements, the movement involved would be so slight, relative to that moved, as to be unnoticeable; and because the approximation would bo so close, neither would a prediction based on it be noticeably at fault.

Since even the minute analyses of quantum physics, though revealing unpredictability in particulars, do not succeed in providing positive evidence of discontinuity, the continuity of physical processes seems more probable than not.

(c) Simultaneity.

The legitimacy of postulating simultaneous 'causation' in terms of either the regularity or entailment definition has been fully discussed above.(26) I need, therefore, do little more than recapitulate here.

It was seen that both commonsense and science are prepared to admit 'causal' connection between factors they regard as simultaneous. And it was further seen that if 'causation' is defined in terms of either regular correlation or entailment then not only is there no intrinsic objection to postulating a 'cause' simultaneous with its 'effect', but the existence of such 'causes' cannot consistently be denied if many commonly acknowledged 'causal' connections are regarded as such. With regard to this latter point, it was seen that although we can never be certain that apparent simultaneity is not infact very rapid alternation of the supposedly simultaneous, there are many factors whose simultaneity it is more reasonable to postulate than not and for whose constant, or necessary, conjunction there is as much evidence as for many 'causal' successions ordinarily recognised by exponents of both the regularity and entailment views of 'causation'.

Moreover, it has but just been observed (27) that not only may correlation of the simultaneous prove a basis of prediction, but it is so regarded by both science and commonsense. If, therefore, its justifying prediction be thought a criterion of 'causal' connection, this need not exclude 'simultaneous causation'

unless the definition be restricted so that a 'cause', properly so called, allows prediction of its 'effect'.

A philosopher who wishes to do so, however, may without self-contradiction eschew common usage, defining 'causation', not simply in terms of regular correlation or entailment, but as regular or necessary sequence. In so doing he should, however, ~~both~~ recognise his divergence from common usage, defend this adequately on grounds of convenience or simplification, and recognise the regularities or entailments between the simultaneous which he cannot consistently deny - allowing for them within his account of the universe and providing a distinctive method of describing them (be it only as 'non-causal' regularities or entailments).

The definition of 'causation' in terms of succession seems to be accepted by many philosophers today, but I know of none who has adequately defended it. Russell, in his recent study of human knowledge, (28) treats it as providing a criterion for distinguishing 'cause' and 'effect'. It is not the only criterion which has been recognised, however: Kant, as has been seen, (29) thought they could be distinguished on the ground that given the 'cause' the 'effect' always occurs while the converse is not true. This criterion is valid, however, only if plurality of 'causes' is accepted; and not only is this doctrine generally rejected, but it has, indeed, been seen (30) to be attributable to commonsense, only in virtue of the looseness of everyday speech. Moreover, Kant's criterion is not one which

can be adopted by those supposing some 'causes' might not have produced the 'effects' attributed to them, all the accompanying conditions remaining the same. Neither commonsense, nor science, has any hesitation in distinguishing simultaneous 'causes' and 'effects', and it seems indubitable that both are, in effect, applying the same criterion in this - namely that of thinking a 'cause's' distinctive feature its indispensibility to its 'effect'. Thus the presence of iodine in the system is called the 'cause' of normal growth, and absence of sun the 'cause' of rickets, and not vice versa, precisely because normal growth and rickets are supposed dependent on presence of iodine and absence of sun respectively, while the converse is not held to be true. It has been seen (31) that there is as good ground for postulating the dependence of many generally acknowledged 'effects' on their 'causes' as for asserting the regular succession of 'effect' on 'cause' in many instances where this is thought justifiable by scientist and philosopher alike. And a criterion thus independent of specific temporal relations, and thus generally applicable, would certainly seem more useful than one more limited, particularly as presumably we should still wish to distinguish and describe the dependences between simultaneous factors which are commonly assumed.

(d) Practically Separable Causal Systems.

Bradley held that nothing in the universe was independent of anything else, and argued that, therefore, there could be no valid 'causal' law which did not take account of everything

happening in the universe. This amounts to the contention that we can discover no valid 'causal' law since we are unlikely to be able to discover everything relevant to such an one, and are even less likely to be able to obtain sufficient data to confirm its truth. Further, unless such a law states functional correlations exemplified throughout the universe at any time, it would be useless for inference even supposing a total state of the universe could be known so as to form a premise in such inference, since it is unlikely that the total state of the universe at any time will recur.

Bradley's denial of separable 'causal' systems, however, is defensible neither empirically nor on the ground of its consistency with his premises. It has been justly pointed out (32) that the progress of science, and indeed of commonsense 'learning about the world', is nothing but the discovery that many factors may, for practical purposes, be regarded as irrelevant to the justice of generalisations and hence to the reliability of inference based on them. Nor is this inconsistent with the truth of Bradley's hypothesis that nothing within the universe is independent of anything else. Circumstances are readily conceivable in which A's dependence on X can be ignored in formulating a law of the form 'Whenever A then B'. For instance, A's dependence on X may be discounted if the latter is equally indispensable both to B and not-B. Thus I cannot produce a flame by striking a match unless a match has been made,

preserved, and passed into my keeping; but I can ignore these conditions in framing generalisations concerning the conditions under which I am likely to produce a flame thus since they are equally indispensable to my failing to produce a flame when striking a damp match. Commonsense was seen (33) to recognise this in treating many conditions it regards as indispensable to an 'effect', as irrelevant to its 'causal' explanation. Whether one accept the Bradleian dictum of complete interdependence throughout the universe or not, one has therefore no justification in denying the possibility that limited generalisations may in fact be true.

As with allowing an interval between 'cause' and 'effect', however, the postulation of such interdependence effectively prevents any 'causal' inference from having more than a high degree of probability; for one can never be sure of not having ignored a relevant factor which may falsify one's calculations in any given instance. As has been observed, (34) however, this need not constitute an objection. Moreoever, the uncertainty in question is not peculiar to a Bradleian world, since even if complete interdependence does not obtain throughout the universe it would seem rash to assume we could always be certain we had not overlooked a factor which could intercept a postulated 'causal' sequence under certain rare conditions.

iii. Interpretation.

The current definitions of 'causation' in terms of regularity and entailment, in excluding applications of the title 'cause' acceptable to commonsense and many philosophers, do not in themselves constitute a denial that there are any phenomena properly describable as 'causal' on other definitions alone. Still less do they amount to an assertion that every event is 'caused' in the regularity or entailment sense of the term respectively. It seems clear that most exponents of these views (and probably all regarding 'causation' as entailment) assume, or explicitly maintain, 'universal causation' consistently with their own definitions; but there are exceptions. Thus Professor Ayer, after accepting the definition of 'causation' in terms of regularity, has stated it to be 'not very probable' that every event has a 'cause' in this sense. (35) He, (and other exponents of the regularity and entailment views) might well differ with other philosophers and commonsense as to the probability of a given type of event being 'caused' in this sense, but this is unimportant for the present purpose, for which it is sufficient to realise that the regularity and entailment analyses of 'causal' law may be discussed independently of the question as to whether all phenomena, or even all connections commonly described as 'causal', may be supposed to exemplify such laws. In the following pages I shall, accordingly, confine myself to the former question.

Exponents of the regularity view defend their position by maintaining necessary connection between 'cause' and 'effect' to be neither observable, nor justly inferrible, from empirical data, while

their opponents deny at least one of these contentions. These latter, however, may regard such necessity as inferrible from experience simply as a presupposition of induction. The most convenient way of discussing both views, therefore, seems to consist in examinging the criticisms of the regularity view offered by its opponents. Before so considering them, however, I shall deal briefly with one or two possible sources of confusion.

It has sometimes been assumed that the regularity view is condemned simply by pointing out an obvious inadequacy in an over-simplified account of the correlation between 'cause' and 'effect' offered by one of its exponents. For instance, the definition of 'causation' in terms of regular sequence has been thus condemned on the ground that 'there are many cases where we admit regular sequence and unhesitatingly deny causation'. (36) This line of argument seems clearly unjustified as it is possible to be mistaken as to the precise nature of the correlation between 'cause' and 'effect' without being wrong in supposing 'causation' involves nothing beyond de facto uniformities. Moreover, since exponents of the regularity view normally think it applicable to the 'causal' laws postulated by science and commonsense, it seems clear that any such oversimplification is either an oversight or due to accidental imprecision in the formulation of their theories.

The argument concerning regular sequence, just cited, exemplifies this type of confusion so clearly that it will repay closer consideration. It should, perhaps, be remarked in the first place, however, that critics of the regularity view are not wholly to blame

for its mistaken use. Russell, when maintaining 'causation' to consist in nothing beyond regularity, (37) himself stated this to mean that hooters of distant factories both sounding simultaneously can be equally regarded as 'causes' of either set of employees going to work. Russell's use of this example is very surprising, and Broad's repeating it, without comment as to its aptness, (38) equally so; for the relation of hooters to workers in distant towns is obviously not of the type ordinarily considered 'causal' by exponents of the regularity view. It is clear, as I have insisted above, (39) that they have in mind, not particular regularities, but those exemplifying general laws. They would, for instance, on this ground refuse to call my walking under a ladder the 'cause' of my losing my umbrella, however strong the evidence that whenever I had walked under ladders I had promptly lost an umbrella. And it is evident that, although there may be a correlation between the behaviour of certain groups of workmen and distant hooters, there is no general correlation between the behaviour of workmen and distant hooters. There is one week of the year when the factory hooters sound in Manchester but no one goes to work at the Glasgow factories, and another when the hooters of Glasgow meet with no response from the workers in Manchester. Again, hooters sometimes sound at different times in different towns; but a hooter sounding in Manchester at 7.25 a.m. does not send Birmingham workers out half an hour early if these are not due at their factory till eight, nor does one sounding in Birmingham at 7.55 a.m. send a fresh influx to the Manchester benches.

Another favourite example of regular sequence whose terms are not ordinarily called 'cause' and 'effect' is that between night and day. This, unlike the former, does serve to show the inadequacy of defining 'causation' in terms of general laws of regular sequence alone. For although there are variations in the succession of day on night, the length of both, and of the period of dawn and twilight, varying (the latter even being non-existent at the equator), yet there is a regular correlation between these variations, the parts of the earth where they occur, and the earth's movement, so that a law of regular sequence between night and day consistent with past evidence could be formulated so long as it took into account a sufficiently complex set of conditions. Yet the succession of night and day lacks a criterion of 'causal' sequence which, whether made explicit or not, seems to be accepted by all exponents of the regularity view - namely that of providing a convenient basis of prediction. Certainly, if one knows the very complex law involved, and all the relevant elements in a complex situation, one will always be able to predict the time and condition of nightfall or daybreak at any time of the preceding day or night respectively, but as the justifiable prediction for any given period of day or night varies with the relation to the sun of the part of the earth in question, clearly this latter, rather than the succession of night and day, is the key factor for such inference. Furthermore, the common practice of regarding the earth's position and movement, relative to the sun, as 'causing' the succession of night and day in general, and

particular variations in these for different parts of the earth at varying times of the year as 'cause' of variations in this succession at different times and places, is consistent with the principle (sometimes made explicit in expounding a regularity theory of causation (40)) of regarding as a relation between 'cause' and 'effect' only those connections which are basic and thus allow correlation of a variety of phenomena.

That both these criteria of 'causal' connection, not only must be recognised by all adequate expositions of the regularity view, but are in fact assumed by most of its exponents, seems clear enough. If direct relevance to, and utility for, prediction is ignored then, on the grounds of regular correlation alone, it would be correct to say that if taking arsenic is regularly followed by death under certain conditions a thunderclap 'causes' death when con-comitant with the taking of arsenic if those conditions are fulfilled, since it is certainly true to say that whenever a thunderclap is concomitant with a person's taking arsenic and these conditions are fulfilled, his death follows. And not only would such usage be useless, inconvenient, and wholly at variance with common practice, but it would be rejected out of hand by most exponents of the regularity view. Again, the history of modern science consists to a very large extent in discarding derivative laws for more ultimate ones under which they are subsumed, and even commonsense regards a 'real' or complete explanation as one which brings out the basic principles on which a postulated 'effect' is thought to depend; while I think most

exponents of the regularity view would agree in conceiving the 'cause' of my hearing the nine o'clock news in terms of sound and radio waves together with the phsyiological conditions of hearing, rather than as my having turned a knob, even though they suppose that whenever I turn a knob under certain conditions I shall hear the nine o'clock news. (It should perhaps be remarked that the tendency to regard the more basic connection, alone, as that between 'cause' and 'effect' seems to a large extent guided by motives of utility and the capacity of the basic connection for correlating or 'explaining' others; thus at present we are generally content to describe 'arsenic as the 'cause' of death rather than looking to the chemical, let alone physical, principles involved for our 'causal' law, presumably because—at the non-scientific level at any rate—the general principles would be less useful to us than the simple derivative connection, and this mainly because we do not know enough of their application to other types of phenomena. Once again, it seems, practical utility for prediction, is a guiding factor).

There are two major confusions to which exponents of the regularity view are liable.

In the first place they sometimes seem to assume their position to be stronger than that of their opponents because these latter postulate something not given in experience. As Ewing has pointed out, (41) they are, in general, entitled to claim no such advantage since they usually regard the 'causal' connections they postulate, not as uniformities exemplified within their own

past experience alone, or even that of others, but as correlations which would occur at any time or place under appropriate circumstances whether they are known to have been experienced there or not. And this remains true even if, as phenomenalists, they interpret a 'causal' law as merely a hypothetical assertion about possible sense data, since in effect they still regard such an one as stating it to be at least highly probable that given experiences would occur under the requisite conditions both in past and present circumstances under which they are not known to have occurred (e.g. they assume that under certain conditions the experience of seeing someone swallow arsenic in the Antartic would be followed by seeing him die in a certain manner), and in the future. And this certainly cannot be said to be given in experience if, as the upholder of the regularity view maintains, the observed cannot be seen to entail the unobserved.

If, however, the exponents of the regularity view are correct in denying a necessary connection between any 'cause' and its 'effect' to be discoverable by us, they are entitled to a more modified claim. For it is then true that they are merely universalising correlations which have occurred in experience, while their opponents postulate a hypothetical connection whose like they can justly claim neither to have observed nor to have found directly evidenced by any phenomenon. Nor is this claim answered by pointing to the non-causal entailments exemplified by phenomena which I discussed above.(42). The intrinsic connections between the character of a note or shade of colour and its relations to others, for instance, can hardly be regarded as

analogues of the entailment of A's existence by that of B.

Secondly it sometimes seems to be assumed that in order to disprove the entailment view one need only show that we have no positive evidence of necessary connection between any 'cause' and its postulated 'effect'. This assumption, though understandable, seems clearly unwarranted. As has been seen, (43) and as has been pointed out by Ewing (44) and Broad, (45) the fact (if it be a fact) of our inability to discover necessary connection between A and B does not prove that there is none, since their intrinsic connection might be undiscoverable by us under any circumstances, or in the present state of our knowledge. (Ewing has pointed out (46) that the Egyptian of 3,000 years ago had no direct positive ground for supposing, any intrinsic connection between the properties of triangles, but that he would have been mistaken had he denied its existence). Or again, as Broad has pointed out (47) 'causation' may be indefinable apart from regularity, though this latter is no more than its sign, simply because it is 'ultimate and unanalysable'.

On the other hand the fact that inability to discover of necessary 'causal' connections does not by itself prove their non-existence, is not sufficient to disprove the regularity view. For if there is indeed no positive ground for either asserting or denying necessary connection between any 'cause' and its 'effect', the only reasonable course is to recognise that, so far as we can judge, either the regularity or entailment view of 'causal' law may be correct.

It is now possible to discuss whether one of these views may be regarded as more acceptable than the other, and whether the choice of one or the other has any practical importance in dealing with 'causal' laws. These two questions are closely linked as it has been maintained that our attitude towards these uniformities presupposes assumption of the uniformity view whether this is recognised or not. (48)

Mace has maintained (49) that necessary connection between 'cause' and 'effect' is discoverable in the sphere of dynamics, in that the result of impact between A and B can be seen to be entailed if they are defined precisely enough. Unless A and B are defined (in part at least) in terms of their reactions on impact (in which case Mace's 'necessary connections' are expressible by mere tautologies such as that whatever rebounds on impact rebounds on impact, which is hardly the type of assertion which most philosophers and scientists (past or present) would regard as expressing a 'causal' law), then, as has been seen, (50) Mace's contention is true only if some uniformities are already assumed so that he is still left with the possibility that 'causal' connections between billiard balls and other movements are reducible to de facto regularities.

As has been indicated, (51) this derivative type of entailment has been potent in convincing philosophers and plain men of the falsity of the regularity view. Nor is this surprising: the contention that 'causal' connections consist in mere de facto uniformities seems clearly falsified by every machine. For it

appears obvious enough that a machine must behave in a certain manner under given circumstances because of the nature and interrelation of its parts. And the fact that it is possible to discover how to complete a machine, or any other complex piece of engineering, by means of mathematical calculations is even more convincing evidence of the presence of entailment since mathematical conclusions, if true, are necessarily so. Such an example as the construction of the Sydney Harbour bridge, whose two havles were constructed separately their meeting properly in their final placing depending on precise mathematical calculation of the expansion and contraction which would occur in the metal, is particularly convincing. Again, given that all macroscopic phenomena are analysable into quantum reactions which latter exhibit statistical regularities such as to determine the character of the macroscopic in any respect, then macroscopic phenomena are clearly necessary in that respect.

But, as I have insisted, (52) all this may be true whether or no the uniformities on which these entailments rest are themselves necessary, since it is the uniformity alone which they presuppose. Thus if it is true that macroscopic movements all exhibit certain constancies, the behaviour of a machine is entailed by the character and interrelation of its parts irrespective of whether those constancies are themselves necessary. And the same is clearly true of entailment in virtue of constancies in the expansation or contraction of metals and statistical regularities exemplified in quantum phenomena; just as, given that every third figure in a

certain pattern is green, A's having that position entails its being green. And the existence of an entailment resting on a de facto uniformity would suffice to explain the repugnance felt by Ewing, (53) in common with the plain man, to such a suggestion as that there is no more intrinsic connection between B's death and A's shooting him (successfully) than between the former and an earthquake at the other end of the world. The suggestion is shocking because it seems that we are such that we cannot fail to die when a bullet passes through heart or brain; but this is so only because we assume certain physical and phsysiological constancies to obtain, and these once more might be merely de facto. And so far as I can see it is quite impossible to tell whether the basic uniformities assumed (consistently with the evidence) by the various sciences, are necessary or not.

It seems to me, therefore, that we have no direct evidence that physical 'causation' does not ultimately reduce to mere de facto uniformities; while at the same time it appears equally undeniable that if it does, there are necessary connections between many events in virtue of these uniformities. (54). This, while it seems more than most exponents of the regularity view are willing to admit, is less than most of their opponents intend to assert. For the latter generally appear to regard 'causal' connection as 'necessary' in the absolute Leibnizean sense defined above. (55).

Both Ewing and Stout have maintained (56) that necessary 'causal' connections are discoverable in the psychological sphere. Here, despite the denials of our insight into voluntary action

offered by Hume (57) and Malebranche, (58) the exponent of the entailment view seems to be on much more promising ground. Thus, for instance, though I can see no objection to supposing my prejudice against regarding arsenic as irrelevant to dying may rest ultimately on a mere de facto uniformity, I cannot think my spontaneously dropping an unexpectedly hot plate completely reducible to such an one. I can see no objection to supposing it may be so reducible insofar as it consists in automatic physical reactions whose counterparts might be reproduced in a machine. But insofar as it involves awareness of a sensation as unpleasant, and a conscious impulse to end it, (59) the experience seems clearly to reveal a non-derivative intrinsic connection. If any exponent of the regularity view does not feel this, then I see no way of convincing him; but it seems clear to me that, when I say I wish to end a certain sensation because it is unpleasant, I am not merely asserting that whenever a sensation is unpleasant I wish to end it. The latter statement, as ordinarily understood, simply does not appear to express the situation at all. If it did, my wishing to end an unpleasant sensation would be analogous to the fact of bodies tending towards each other to a degree inversely proportional to the squares of their distances, for which we can see no inherent necessity (even though we may see this - or rather, as Stout puts it, (60) a law which is practically equivalent to this - would be entailed by the correctness of Einstein's conception of the universe). Nor does it seem justifiable to regard as tautologous the assertion that I wish to end a sensation because it is unpleasant. For the recognition of A as unpleasant,

and the impulse to end it appear to exemplify two basically different types of experience, the distinction between which has been recognised by philosophers in their designating them 'cognitive' and 'conative' respectively. Again, if anyone cannot recognise this distinction within his own experience, I have no means of convincing him of it; I can only repeat that I am convinced of its existence because I find it in mine.

Ewing points to a similar type of experience (61) as an instance of intrinsic connection between the occurrence of one event and that of another. His example is of greater complexity than mine, however, and I think this lessens its force. For he instances the connection between a person's death and his friend's sorrow and, as he himself recognises, it is easy enough to think of instances when this connection does not hold. If A has gone mad, or his friendship for B turned to hatred, before the latters death, he may well rejoice at this; and even though their friendship remains strong till B's death, if A is unselfish and B when he died was suffering from a painful and incurable disease, or A believes him to have passed to a happier state of existence, his sorrow will be at least considerably tempered. Or again, if A is in a state of exhausation at the time of B's death, having nursed the latter through a long and distressing illness; no matter how strong his affection for B, he may be incapable of anything but relief when the latter dies. But if one analyse the intrinsic connection which one nevertheless seems to see between B's death and his friend's sorrow, one sees that it is

only when we suppose B's living to give A pleasure that we are convinced of an intrinsic connection between the former's death and the latter's sorrow. And, once more, this connection seems neither to consist in regularity alone nor to be expressible by a tautology. Again we, or I at least, seem to be aware of an inherent necessity which appears lacking in other uniformities, however well attested. And since the experience of sorrow seems clearly distinct from the mere absence of pleasure, it seems indubitable that here is a genuine connection between two distinct terms. Furthermore, the basic intrinsic connection between loss of pleasure and sorrow serves to explain both the exceptions to Ewing's example, and our recognising, irrespective of any evidence of their occurrence, that they must be exceptions.

Both Ewing (62) and Stout (63) cite a very significant example of intrinsic 'causal' connection, namely that involved in the psychological process of inference. This process - namely the passage from belief in, or acceptance of, certain premises to assent to a given conclusion - is not to be confused with the entailment of a conclusion by premises, which clearly is not 'causal' in the ordinary sense of the term. That the connection between belief in premises and assent to conclusion is distinct from that between premises and conclusion in themselves, is evident. For while, from the nature of the case, if the premises entail the conclusion, they do so invariably; a person may, on occasion, fail to infer the latter from the former, particularly if their connection is complex and abstract as in the deductions

of advanced mathematics.

It might, perhaps, be argued, however, that to regard the psychological connection as necessary (if not in plain contradiction to the existence of failure to 'follow' arguments) consists in an unwarrantable attribution to this of a characteristic peculiar to the connection between premises and conclusions. It might be thought, for instance, that the psychological phenomena of inferring is adequately accounted for in terms of a de facto uniformity - namely that whenever a person believes the truth of certain premises to justify a given conclusion, then he does not assent to the one without accepting the other (or at least behaving in a manner appropriate to this under certain circumstances).

If, however, one accept the account of meaning and entailment outlined in the Introduction above, (64) then it is evident that when given premises entail a certain conclusion, accepting the former with understanding entails assenting to the latter. Nor indeed is this peculiar to purely deductive inference, since if my account of meaning is true then A does not render B probable unless assenting to A with understanding entails accepting B as probable (at least when the question of doing so is raised), ~~since~~ as one could not be said to fully understand A if one failed to realise this connection when considering A and B in conjunction. Furthermore it is impossible to give an adequate account of inference in other terms. For if the uniformity it exemplifies is not to be stated tautologously, it must be possible to define 'believing the truth of certain premises to justify the acceptance of a given conclusion' in terms other than 'acceptance of

the conclusion whenever the premises are assented to'. But this is possible only by introducing the notion of 'understanding' in the sense defined above. And once acknowledgment of the conclusion's acceptability is admitted to rest on the meaning attached to premises and conclusion, the intrinsic connection is assumed.

The importance of this example, however, lies in the fact that, even if this account of inference is not admitted, it is presupposed in every assumption that accepting a given conclusion is justifiable. For if my inferring is never more than an exemplification of a mere de facto regularity, the terms 'justifiable' and 'unjustifiable' are no more applicable to it than to the outcome of a conditioned reflex. If I am to be able to point to premises in vindication of acceptance of a conclusion then my assent to the latter must, in that instance at least, depend on its being entailed by my acceptance of the former in virtue of the meaning I attach to both. Nor is this true of purely deductive reasoning alone. For it is only possible to be justified in accepting a conclusion as probable, if one recognises both that a certain type of criterion would render it so and that this is exemplified in certain premises; in which case acceptance of the latter entails assenting to the probability of the former. Thus no one who maintains that no 'cause' entails its 'effect' is entitled to regard any conclusion as justifiable.

Ewing also points to memory (65) as an example of the entailment of 'effect' by 'cause'. And it is true enough both that the character, at least, of a veridical memory experience, as ordinarily conceived, is thought to be entailed by that of the remembered situation, and that it seems impossible not to regard it so. I

think, however, that mnemic phenomena could be accounted for in terms of regularity alone, so that this example is less convincing than the others. But this, to my mind, is unimportant since these latter suffice to refute the contention that no 'cause' entails its 'effect'.

The existence of such examples, however, does not justify the contention that all 'causes', or even all those definable in the modern style in terms of 'law', entail their 'effects'. Nevertheless it does render that assumption more justifiable than it would otherwise be, by showing this to consist in postulating relations of a type met with in experience.

Ewing (66) and Stout (67) both contend that inference from 'cause' to 'effect' is only justifiable if a 'cause' entails its 'effect' since the premises of a valid argument entail its conclusion. To my mind, this argument stands condemned by the fact that it excludes the validity of any probability inference, while it seems undeniable not only that the possibility of such inference is generally accepted, but that it cannot legitimately be denied. Indeed, I cannot really believe that Ewing, presented with the dice in Hume's illustration, (68) would think it illegitimate to infer himself more likely to throw the figure inscribed on four sides merely because his actually doing so was not entailed by the available data. As I have suggested, every valid argument does indeed involve entailment, but not necessarily that of the certain truth of the conclusion given that of the premises, since that entailed may be merely the legitimacy of regarding the conclusion as probable.

To prove his point, therefore, Ewing would have to show that 'causal' inference, in particular, is justified only if the 'cause' entails its 'effect'. There is not a priori ground for supposing this. There is no intrinsic impossibility in all A's being followed by, or simultaneous with, B's although there is no intrinsic connection between them; and if it is possible to discover this, or even justifiable to think it probable that this relation holds for most A's, the inference that B is to be expected given A, will be justified. (Though of course it will not be legitimate to infer that it will necessarily occur). And, indeed, it has been seen that if one assume the basic uniformities postulated by science, then some 'causes' not only may, but must, be regarded as entailing their 'effects'. Since, as Ewing himself admits, (69) these basic uniformities cannot be seen to be necessary, the denial that they can be justly postulated if regarded as merely defacto, amounts to the contention that we never have legitimate grounds for supposing a purely de facto uniformity probable. This, Ewing discusses (70) as a separate question, maintaining that, in the absence of an intrinsic connection between A and B their conjunction is a mere coincidence, their conjunction in a large variety of known instances being thus extremely improbable, and their universal conjunction fantastically so. On this argument, if the conjunction between A and B is merely de facto, the more frequently and universally it has been observed in the past the less likely it is to recur in the future so that inductive evidence has the reverse implication to that normally assumed when it is considered in relation to postulated uniformities. This argument,

however, although useful in pointing out that induction alone cannot render a de facto uniformity probable, completely fails in its purpose of showing such an uniformity intrinsically improbable. For surely coincidence is excluded from the conjunction of A and B, not only by their intrinsic connection, but also by their de facto universal correlation. If all bodies tend towards each other to a degree varying inversely with the squares of their distances, and this is neither intrinsically necessary nor entailed by the character of the universe, it is surely an abuse of language to describe the earth's doing so as a 'coincidence'. Ewing's argument therefore assumes what it sets out to prove, namely that there can be no inductive grounds for postulating a de facto uniformity (a much wider assumption than the contention that induction alone would not suffice to justify this). Induction will be more fully discussed in the concluding section of this chapter; so here I shall merely remark that since the only inductive evidence for necessary connection is that for a regular correlation, it would seem that if this justifies the postulation of either, it gives that of the latter a higher probability than that of the former since the one asserts less than the other.

It might perhaps be contended that to admit some 'causes' to entail their 'effects' intrinsically, while allowing that others, if entailing theirs, do so only in virtue of a uniformity which may be merely de facto, is to exclude any unified account, or definition, of 'causation'. But this is not necessarily so. If one confine oneself to 'causal laws' there is, so far as I can see, no objection to defining 'causation in terms of regular correlation while at the

same time allowing that some 'causes' are not only regularly correlated with their 'effects, but entail them either intrinsically or in virtue of other correlations which sometimes may well be de facto. Or, again, one may adopt the commonsense definition of a 'cause' as indispensable to its 'effect', allowing that some 'causes' are regularly correlated with their 'effects', some entailing theirs either intrinsically or derivatively. The experience of commonsense reveals that, in practice, there is no difficulty in applying so wide a definition. Furthermore, it has the added advantage that it excludes no common use of the term 'cause', whether one regard 'voluntary' action as entailed or no.

iv. Our Grounds for Postulating Causal Laws.

In the following pages, I mean by inductive evidence observational data relative to the truth of a generalisation; and I assume it to be obtained by a judicious combination of Mill's methods (with the possible addition of others). I shall not consider, here, methods of obtaining such evidence (a technical subject which has received a good deal of attention from logicians in the past century). Instead I shall confine myself to the crucial question as to whether generalisations may be justified by numerous and comprehensive observations in which a given factor has never been known to be absent under certain specified conditions or to be present under others, and if so under what conditions; and whether such evidence is indispensable to their justification.

In the first place it is necessary to repeat (71) that the direct information supplied by inductive evidence is, relatively speaking at least, extremely limited. For, as I have pointed out, (72) at best the available evidence covers only a minute fraction of the observations which could have been made in the present and past. That a uniformity has occurred constantly up to the present is thus as much a matter of inference as its continuing to obtain in the future.

It has been seen (73) that the possibility of coincidence shows the most extensive evidence of uniformity incapable, by itself, of justifying inference to its exemplification in future

instances. And other circumstances capable of invalidating such inference are readily conceivable. For instance, given that a relatively small proportion of A's are B's, the greater the number of A's which are observed without any failing to be a B, the less the probability that the next A observed will also be a B: thus given that a well shuffled pack of fifty two cards contains thirteen spades, and that the first twelve drawn from it at random without being replaced are spades, the probability of the thirteenth being a spade is far less than it would have been had no spades been drawn—the probability of the next card being a spade having throughout the experiment decreased proportionately to the number of these drawn. It might be objected that this is an example of induction by simple enumeration which can readily be seen to be inadequate in most empirical investigation. This objection, however, is irrelevant to the point at issue. In the present instance this is the only method applicable. Moreoever, although careful and comprehensive variation of observational conditions and correlation of the results of investigations in slightly different spheres, may help to exclude false generalisations, the point at issue is that a perfectly true generalisation concerning the past and not merely a limited experience by itself, may fail to justify inference to its obtaining in any future instance. (74) It seems clear to me, therefore, that at the least, repeated experience of a corresponding correlation can only justify inference to its occurrence in a future instance if it is assumed: (a) that the past correlations have not been coincidences; and (b) that they do not form a small

proportion of the instances in which the term forming the basis of the inference occurs. This being so the experience of an uniformity in the past, however widespread and comprehensive the observations attesting it, seems incapable (by itself) of justifying the assumption of its universality. Furthermore, as was observed above, (75) even though it be assumed that, no A's which are not B's having been observed, each additional observation of an A that is a B renders it more probable that all A's are B, the known observations thus favouring any postulated uniformity are so few in relation to those which might have occurred that the probability they can confer on it is infinitesimal.

Moreover, Russell seems justified in contending that on neither of its generally accepted definitions is probability capable of justifying prediction. As he points out, (76) on the finite frequency definition it is possible to estimate only the probability of a past observation having had a certain characteristic, or of a past induction observing certain rules having been successful, but to assume this to continue to be true of future observations or inductions is to pass 'outside the finite frequency theory since we are dealing with classes of which the numbers are not known'. And on the other hand, as he has also remarked, (77) Reichenbach's inductive posit resting on the view of probability in terms of frequency tending to a limit in an infinite series - namely that a frequency observed in a long series is to be assumed to approximate to that discoverable however far this is extended - can easily be falsified. And indeed, as he has suggested, if probability is

conceived in terms of frequency in an infinite series, then there is no evidence inconsistent with any given probability since in an infinite series any frequency occurring in a finite section, however long, can be counterbalanced. Moreoever, it is evident that the estimates of probability of whose justice we have no doubt (namely those concerning throws of dice etc) rest on knowledge of the structure of the phenomena concerned (e.g. that the dice has six sides each differently marked, and is so constructed that it may fall with any one of them uppermost when thrown). Were this not so, we should not be convinced of the justice of these estimates independently of experiment, as we are; nor would our confidence be unaffected by subsequent empirical confirmation, as it is.

In dealing with the indefinite series with which the most important inductions of commonsense and science are concerned, it is clearly impossible to base inference on data analogous to a dice's having six sides equally capable of falling uppermost, or the distribution of black and white balls within a set of containers; for this is just the type of knowledge which is unobtainable concerning the universe, or its history, as a whole.

There is, however, one type of assumption, and one only, which seems capable of justifying either generalisation or inference to unobserved particulars on the basis of inductive evidence - namely that the universe as a whole, or a specific type of phenomenon within it, exemplifies certain uniformities. Thus if it is held that everything (or everything of a given general type) is correlated in a certain manner with something of a type so related

to all of its kind, then it seems legitimate to infer that if careful, widespread, and comprehensive, observations have invariably revealed the appropriate relation to hold between A's and B's, their conjunction constitutes an example of this law so that they may reasonably be expected to be so related in the future and supposed to have been so in unobserved instances in the present or past (given that any other relevant conditions obtain). Thus if it is assumed that there is no event of a type not invariably followed (under certain circumstances) by events of another given type; then if careful investigation has revealed many A's, none of which have not been followed by a B (given X), it is reasonable to suppose that B is A's invariable consequent, and so to expect it to follow when A occurs and X obtains. The precise nature of the uniformity which must be assumed to justify any given induction would seem to depend on the nature of the latter. The inferences made by science seem to require two, namely: (a) that nothing exists of which it is not true that its like does so only under certain conditions (or at least one of a finite set of alternative circumstances); and (b) that at least every type of physical event occurs whenever certain conditions are fulfilled. It was seen above, (78) in discussing commonsense, that these assumptions must be distinguished one from the other. That science presupposes both seems clear. For instance, the bacteriologist who is satisfied that he has traced the 'cause' of a given disease to a certain microbe, generally supposes himself to have discovered, not only conditions under which the disease invariably occurs, but also that the

elimination of which mean the elimination of the disease. Similarly, the physicist who supposes billiard balls invariably behave in a certain manner under given conditions also believes they will not behave thus in the absence of those conditions. Modern philosophers have generally concentrated their attention on the former type of regularity, presumably because the laws made explicit by science generally postulate these primarily; but the latter type are clearly presupposed in all scientific investigation; thus the results derived from physical experiments rest on the assumption that measuring instruments, not only behave in a certain manner under given conditions, but ~~that they~~ do not do so when those conditions are not fulfilled.

Most modern scientists and philosophers assume that at least no physical event occurs in the absence of conditions of a type given which one of its kind invariably occurs. This wider assumption, however, does not seem to be required to justify any of the specific inferences made by scientists, the two I have mentioned being sufficient to justify any particular conclusion of the form 'No A occurs in the absence of a B, while given B an A invariably occurs' if adequate observations have revealed neither an A nor a B occurring in the absence of the other. My aim, legitimately enough it seems, has been to discover the least which must be assumed concerning the universe in order to justify the inductions on which science rests both in its formulation of laws, and in its reliance on instruments (and other elements in experiment).

Furthermore, given the two assumptions I have postulated, the need of repeating observations for the purpose of confirmation is reduced, if not excluded, once a limited number of precise and comprehensive experiments have been made. And when sufficient previously established conclusions are relevant, one such observation might carry assurance. The ascription of these assumptions to scientists thus serves to explain the relative irrelevance which they normally attach to repetition in respect to the confirmatory value of observation and experiment. It also explains the conviction they ordinarily have, in effect, (whatever the verbal concessions they may make to philosophical criticism) that if their data and its analysis has been adequate, their conclusions are infallible.

As I have pointed out above, (79) I can find no ground for supposing either of the above mentioned presuppositions of induction necessarily true. And the foregoing, by showing they must be assumed in order to justify induction relative to the universe in general, should have made it plain that their probable truth cannot be inferred inductively. Nevertheless, as I have already suggested (80) regarding the first of them, the fact that their denial is inconsistent with accepting the inductions recognised by both science and commonsense, seems a sufficient ground for accepting them since, in practice at any rate, we are unprepared to reject those inductions. For though a philosopher may make a useful contribution to the history of thought despite inconsistencies in his system, he can hardly

claim any right of preference for his views unless he professes to respect consistency - which profession would be blatantly unjustifiable in one maintaining a position fundamentally at variance with his ordinary attitudes and assumptions.

Before leaving the subject, it might be well to remark that the foregoing is unaffected by Keynes' argument to show that 'causation' is not a presupposition of probability inference. That it is not presupposed in probability arguments which do not constitute inference to some 'causal' uniformity, is clearly no ground for supposing this true of those that do. And it is of course undeniable that all probability inference not directly concerned with causal laws, if regarded as having any empirical application, rests on the assumption of such uniformities. Thus, for instance, probability inference applicable to actual dice assumes that these always behave in a certain manner under given conditions eg. g. that when thrown they fall with one side uppermost and are not transformed into white rabbits or spheres.

CONCLUSION - A SUMMARY.

It was seen in introduction to the general discussion: (a) that ostensive definition is both possible and indispensable, and thus that assertions concerning empirical phenomena are possible; (b) that intrinsic connections or entailments are both discoverable among such phenomena, and may be so expressed verbally that genuine knowledge concerning them may, on occasion, be obtained by means of verbal deductions.

In discussing various uses of the terms 'cause', 'causation', 'causality', 'causal', it was found that commonsense, Aristotle, St.Thomas, Descartes, Spinoza, Leibniz, Berkeley, Hume, Kant, and most modern philosophers are agreed in supposing that the 'cause of A' properly so called is that in the absence of which A does not occur (under certain conditions at least). Commonsense, Aristotle, Descartes, Leibniz, and Berkeley, however, were seen to differ from the others in holding that the title 'cause of A' may be applied to an existent of a type whose exemplifications are not invariably correlated with A's. It was further seen that Aristotle aligned 'causation in general with artificial making such as casting a statue, and that St.Thomas, in inheriting this idea and at the same time regarding a creative God as the 'cause' par excellence, helped to foster the conception of a 'cause' as essentially a producer in the sense of a persisting subject directly initiating the coming into being of its 'effect'. The application of this conception to physical 'causation' was seen to consist in regarding an instance of this as a series of events in the history

of one continuant as 'cause', which at the same time constitute a process of change in another-this latter process, or its completion, being regarded as the 'effect'. The discovery and development of the successful application of mathematics to physics, on the other hand, was found to promote the conception of the universe as a system of necessary entailment, and of the 'cause of A' as essentially that entailing A's existence. Berkeley was seen to challenge this view of the physical world by regarding its uniformities as dependent on God's will alone, while Hume carried the process a step further by contending solely that we have no ground for regarding them as anything but de facto. And Kant was found to respond to Hume's challenge by supposing that while denying the possibility of detecting in phenomena any intrinsic entailment, it was possible to justify the postulation of necessary 'causal' connection between them as a presupposition of experience. And modern philosophers were observed to have continued the debate as to whether 'causes' may be said to entail their 'effects' or not.

With regard to this debate I have maintained that: (a) since Kant's conclusions can only be justified by the discovery of an intrinsic necessity in experience, his denial that this is possible invalidates his solution; (b) within the psychological sphere certain causes can be seen to entail their 'effects', and further that unless this is admitted to be so in inferring, regarded as a psychological phenomenon, no rational justification can be claimed for adherence to any conclusion; (c) if uniformities such as the

laws of motion, obtain within the universe, then some 'causes' will entail their 'effects' in virtue of these, but as we seem to have no ground for supposing these basic uniformities necessary, we are in no position to deny that phsyical 'causal' connections may be ultimately reducible to purely de facto regularities; (d) there seems no objection to regarding some 'causal' uniformities as thus reducible, while supposing others intrinsically necessary.

With regard to the postulation of 'universal causation', two assumptions which (on differing definitions) may be so described, were seen to be presupposed if causal inferences based on empirical evidence, which are admitted or assumed by science, are to be logically justifiable. These assumptions are: (a) that nothing exists of which it is not true that its like does so only under certain conditions (or at least one of a finite set of alternative circumstances); and (b) that at least every type of physical event occurs invariably under certain conditions. For neither of these could I find any justification beyond the inconsistency of their denial with the 'causal' inferences we all accept, but this (in the absence of any effective argument against them) seemed sufficient to justify their acceptance, though admittedly incapable of conferring complete certainty on them. And thus conclusions resting on them cannot legitimately be regarded as more than highly probable in the sense of it being more reasonable than not to accept them.

Finally, with respect to the nature of the correlation between 'cause' and 'effect', I maintained that: (a) this must be regarded as generally complex; (b) on all definitions of 'causation' save that

in terms of succession, the admission of 'causes' simultaneous with their 'effects' is not only legitimate, but desirable; (c) 'cause' and 'effect' may, without self-contradiction or inconsistency with the evidence, be regarded as either separated by a finite interval containing nothing in virtue of which they may be linked, or as connected by a continuous process or (in time alone) by something coexistent with both, but that they cannot be supposed contiguous in a sense inconsistent with the continuity of the temporal or spatial; (d) there is no contradiction in admitting non-spatial or non-temporal 'causes' or 'effects', and that to regard psychological phenomena as 'causes' or 'effects' is to postulate non-spatial 'causal' relations.

I have not discussed the general question as to whether sentences 'about causes' and 'causation' express statements concerning anything but words (a question as ambiguous as the definitions of 'cause' are varied). I hope, however, that the foregoing specific discussions have made it clear that there are many statements 'concerning causes and causation' which (whether justifiable or not) are not merely verbal; and further that there is no commonly accepted definition of 'cause' given which it is unreasonable to apply the term to any existent.

NOTES TO CHAPTER VIII

(1). Ch.2. Sect.iii pp183-7

(2). Once again I am considering general trends in modern thought, and am not intending to claim exhaustiveness for my account.

(3). Human Knowledge (Allen & Unwin 1948) pp.471-2.

(4). Ch.6.Sect.iii (d) (B) pp.389-90.

(5). Cf.Supra Ch.4 Sect.iv pp.315-6, 319-20.

(6). Ibid. p.316.

(7). Mysticism and Logic pp.187-8.

(8). Human Knowledge pp.335,497.

(9). Ch.6 Sect.v pp457-8.

(10). Vide 'On the Origin of Laws of Nature', in a supplement to Nature June 1937.

(11). Perception Physics and Reality pp.143-4.

(12). Supra Ch.1.Sect.ii (b) p.133

(13). Ch.6 Sect.iii (d) (A) pp.382-6.

(14). Mysticism and Logic p.187

(15). Ch.6.Sect.iii(d)(A) p.387.

(16). Ibid.pp.386-7.

(17). Ib.p387.

(18). Mysticism and Logic p.187.

(19). Ch.1.Sect.ii.(a) p.98

(20). Human Knowledge p.246.

(21). Appearance and Reaility pp.60-1.

(22). Perception Physics and Reality pp.114-7.

(23). Ibid. pp.115-6.

(24). This is the more surprising in Broad in that he regards stating its inconsistency with the continuity of time as a sufficient ground for dismissing Hume's position (Perception Physics and Reality p.106).

(25). Philosophy and the Physicists Ch.VII pp.178-182.

(26). Ch.6 Sect.iii (d) (B) pp.395-400.

(27). pp.573-4.

(28). Human Knowledge p.349.

(29). Supra Ch.7 Sect.1v p554.

(30). Ch.1 Sect.ii (a) pp.105-6.

(31). Ch.6 Sect.iii (d) (B) pp.402-3

(32). Cf.Broad: Perception Physics and Reality pp.145-6.

(33). Supra Ch.1 Sect.ii (a) pp.110-1.

(34). pp.573, 575-6.

(35). The Foundations of Empirical Knowledge p.219

(36). Broad: The Mind and Its Place in Nature (Kegan Paul Trench & Trubner 1937) p.453.

(37). In Human Knowledge(pp.472, 508-9) he shows himself dissatisfied with this view.

(38). The Mind and Its Place in Nature pp.454.

(39). Supra Ch.2 Sect iii(b) pp.183-7.

(40). Cf.Broad: Perception Physics and Reality pp.130-7.

(41). A Defence of Causality: Proceedings of the Aristotelian Society 1933 pp104-5.

(42). Introduction Sect.ii pp.48-52.

(43). Ch.6 Sect.iii (e) (B) p.413.

(44). Symposium on Mechanical and Teleological Causation: Supplementary Proceedings of the Aristotelian Society Vol XlV (1935) p68; A Defence of Causality p.103.

(45). The Mind and Its Place in Nature p.454.

(46). A Defence of Causality pp.122-3.

(47). The Mind and Its Place in Nature p.454.

(48). Cf.Ewing; A Defence of Causality pp.115-8 Stout: Symposium on Mechanical and Teleological Causation p47.

(49). Ibid pp.42-3

(50). Ch.1 Sect.iii p150
Ch.6 Sedt.iv p451

(51). Ch.6.Sect.iv p.451.

(52). Ch.1 Sect.iii p.150
Ch.6. Sect.iv p.451
Ch.8 Sect.i p.569

(53). Cf.A Defence of Causality pp.96-7.

(54). It seemed unnecessary to reiterate the point made by Ewing (Sympsosium on Mechanical and Teleological Causation pp75-6) that a 'cause' cannot properly be said to entail its 'effect' insofar as this is determined merely by a non-causal necessity - i.e. one which would hold independently of any 'causal' connection. That the ascription of entailment to phenomena does not necessarily involve postulating entailing 'causes' should have been made clear above, by the second half of the Introduction.

(55). Ch.4 Sect.iv p.316

(56). Symposium on Mechanical and Teleological Causality pp.50,68; Cf.also Ewing: A Defence of Causality pp.111-3 124-6.

(57). Enquiry Into Human Understanding Vll (Pt.1) 52 (65-7),53(68)

(58). Recherche de la Verite Bk Vl Pt.ll Ch.3 (T.Taylosr's tr. 1700 p.56) & Eclairissement pp.171-2).

(59). I use the word 'impulse' advisedly since it would be clearly false to assert that we necessarily try to end unpleasant sensations; if the hot plate holds appetising food and I am hungry I may well do my best not to drop it, while on a higher plane people have been known to refuse to recant beliefs or to give information under torture though knowing that to do so would end it.

(60). Symposium on Mechanical and Teleological Causation p49.

(61). A Defence of Causality pp.124-6; Symposium on Mechanical and Teleological Causality p68.

(62). Symposium on Mechanical and Teleological Causality p68; A Defence of Causality p.113.

(63). Symposium on Mechanical & Teleological Causality p.50

(64). Sects. i (b) & ii pp.11-69.

(65). A Defence of Causality pp.112-3

(66). Ibid. pp.115-6

(67). Symposium on Mechanical and Teleological Causation p47.

(68). Treatise 1.iii.XI (126-30)

(69). Symposium on Mechanical and Teleological Causation pp.75-6.

(70). A Defence of Causality pp.116-8.

(71). Cf.Ch.1 Sect.iii p151.

(72). Ibid.

(73). pp.608-9.

(74). Russell notes some interesting examples of 'false inductions' by simple enumeration, in arithmetic (Human Knowledge pp.420-2)

(75). Ch.1.Sect.iii pp.151-2

(76). Human Knowledge pp.377-8.

(77). Ibid. p432.

(78). Ch.1.Sect.ii (a) p.107

(79). Ch.1. Sect.iii p.149; Ch.6.Sect.iii (e) (C) pp.418-20.

(80). Ch.1 Sect.iii pp.150-3. Ch.6 Sect.iii (e) (C) pp.420-1.